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COMPUTERWORLD

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Oracle thinks big — like being a $10 billion firm — but some users are starting to worry that ambitious plans overlook their current needs. Page 7.

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Data General resumes price/performance war with DEC. Page 6.

Management profile: Kailash Khanna speaks out on his move from a glamorous American Express post. Page 111.

BULLETIN: IBM said Friday that it will delay initial shipments of its AIX PS/2 operating system until March 1989. Shipments had been scheduled to begin last month.

DEC splits ballot on PS/2 bus

BY WILLIAM BRANDEL
CW STAFF

Digital Equipment Corp. effectively handed IBM's Micro Channel Architecture a vote of confidence last week by announcing software that will allow personal computers with the proprietary IBM bus to connect to the Decnet network.

Simultaneously, DEC announced a technology exchange agreement with MCA-compatible vendor Tandy Corp. that enables DEC to resell Tandy products.

Although DEC took pains to declare it was not endorsing IBM's Personal System/2 bus technology, it brought the Micro Channel into its own enterprise networking strategy, citing customer demand for a "single networking solution."

Actions speaking louder?

Contradicting the appearance of Micro Channel support, DEC repeatedly hammered home its official position last week that "no Micro Channel products will be supported by Digital." Despite proclaiming MCA support on Decnet after the announcement, DEC claimed that it still supports only the 16-bit industry standard architecture.

But DEC may be poised to resell Tandy's version of the Micro Channel if circumstances warrant. According to a Tandy source, DEC has the option of reselling a custom version of the Tandy 5000 MC, an MCA clone.

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LAN alliance

- HP and DEC are expected to reveal decisions to use Microsoft's OS/2 LAN Manager in their connectivity strategies. Page 149.

IBM starts distributing data

Plans limited ties between DB2 systems in '89; full function still pending

BY STANLEY GIBSON
CW STAFF

RYE BROOK, N.Y. — IBM took an important first step toward a distributed version of its DB2 relational database last week, allowing one DB2 database to communicate with another. The new capability is included in DB2 Version 2, Release 2, which is set to be available in the third quarter of 1989.

The announcement came at the same time that IBM said it began to ship Version 2, Release 1, which includes referential integrity.

Release 2, although limited, is a building block in IBM's master plan to provide distributed data capability across all Systems Application Architecture environments, including mainframes, mid-range processors and personal computers, according to IBM.

DB2 2.2 features

- Multisite reads of a DB2 database
- Single-site update of a remote DB2 site
- Updates from IMS, CICS, TSO or batch
- DB2 security features apply across network
- Data integrity applies

Vince Hilly, director of data administration at Depository Trust Co. in New York, said the distributed capability "addresses a problem that we have with DB2. Data on one DB2 system is not currently accessible from another DB2 system." Making it accessible through CICS Cobol programs using LU6.2 is possible but difficult, he pointed out.

Another large, experienced user of DB2 was less concerned about the DB2 2.2 announcement than implementing the referential integrity and data handling features of DB2 2.1.

"I don't see immediately a big bang here. We are just planning for a vanilla Version 2, Release 1," said Jim Williams, manager of database administration at Empire Blue Cross/Blue Shield in New York. His shop has no plans for the distributed capabilities of Release 2 but eagerly welcomes the improved performance of Release 1. He is in the process of implementing a large database of claim-history records that will

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COMPUTER LEASING

It's a buyer's market

BY CLINTON WILDER
CW STAFF

That old whipping boy "conventional wisdom" sure has taken a beating in the computer leasing business.

When federal tax reform wiped out the investment tax credit at the end of 1986, it was universally predicted that computer leasing deals, robbed of their status as a great tax shelter, would have to compensate by increasing users' rates. In addition, the resulting wave of consolidation among computer lessors reduced the number of players, and that, too, was supposed to drive rates up as competition declined.

Wrong, and wrong again.

Instead, the computer leasing industry, always known as competitive, has become a vicious battleground for market share. Lessors large and small are resorting to the leasing equivalent of chip dumping — losing money on deals in order to entice new customers or keep old ones. And the big winners, at least for now, are the customers.

"It is very much a buyer's market," says William Dean, director of technology management services at Pepsico, Inc. "A number of the competitive offerings we've seen are probably not realistic from the

Continued on page 124

Lessors absorb tax bite

Typical lease for IBM 3380 products indicates user's cost today is the same as in late 1985, before elimination of tax credit, even though residual value has declined

SOURCE: COMPUTER SALES INTERNATIONAL, INC.
CW CHART

Users lament Lotus delay

BY DOUGLAS BARNEY
CW STAFF

CAMBRIDGE, Mass. — Ouch! That is how users reacted last week after being slapped with the news that Lotus Development Corp.'s 1-2-3 Release 3.0 will be delayed until the second quarter of next year.

The delay is the fourth since the original announcement in late April 1987. It also pushes back a series of critical products, including 1-2-3/M for IBM mainframes, 1-2-3/Mac for Apple Computer, Inc. Macintoshes and 1-2-3/Unix for workstations.

These products are all based on Release 3.0 and were preannounced in what some viewed as an effort to freeze Lotus competitors out of the spreadsheet market. Even if Lotus makes this timetable, Release 3.0 will ship more than two years after the original announcement.

Users rocked by prior delays had not braced themselves for this shocker. While some clearly remain loyal, others may just give up. "You get tired of waiting after a while. I am not going to wait," said Frank Diasparra, vice-president of technology services at Fidelity Investments in Boston. Using a two-pronged strategy, Diasparra is still buying today's 1-2-3, but at the same time he is moving some users to Microsoft Corp.'s Excel. "Excel will gain some steam,"

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"The days of easy profits are long gone."

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Congress passes shield for tech bankruptcies

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — High-technology industries won a significant victory last week when the U.S. Congress approved a bill that protects companies from losing access to licensed technology and software if the licensor goes bankrupt.

The legislation resulted from an intensive lobbying effort by the Computer and Business Equipment Manufacturers Association (CBEMA), as well as ADAPSO, a computer software and services association, and other industries.

The computer industry grew concerned about the issue after a federal court ruled, in *Lubrizol* v. *Richmond Metal Finishers*, that when a technology licensor goes bankrupt, the bankruptcy judge may rescind all license agreements or even resell the technology to the high bidder.

A computer company that depends on a particular semiconductor chip, for example, would face big problems if the chip maker went bankrupt and the chip license was retracted. CBEMA said the ruling cooled technology-license negotiations.

Lubrizol v. *Richmond Metal Finishers*, decided in March 1985, had a chilling effect on large companies that wished to license technology from small ones, said Ron Polanski, general counsel in the government relations department of ADAPSO.

"There has been a certain reluctance on the part of potential licensees to do business with some companies for fear that small, entrepreneurial and undercapitalized companies are more likely to go bankrupt," Polanski said. "The only recourse some licensees had was to demand outright ownership of the licensor's technology."

The legislation exempts intellectual property — copyrights, trade secrets and chip designs — from the general rule that licenses can be rescinded in bankruptcy proceedings.

The Senate passed the bill last month, and the House of Representatives quickly followed with a 415 to 1 vote last week. President Reagan is expected to sign the bill into law later this year.

Ameritech merges MIS

Telco workers join Applied Technologies staff

BY JAMES CONNOLLY
CW STAFF

CHICAGO — Ameritech announced last week that it implemented its long-planned move to merge the MIS staffs of its telephone companies and nonregulated subsidiaries into a single systems group.

With the announcement, 3,000 MIS employees in five Midwestern telephone companies were transferred to the new Ameritech Applied Technologies. Most of these programmers, analysts and managers will, however, stay on-site with the operating companies in Illinois, Indiana, Michigan, Ohio and Wisconsin.

The focus of the nonregulated subsidiary will be on systems development with a particular emphasis on building common systems, such as a single billing system that can be used by all five operating companies.

A spokesman for Applied Technologies said such common systems would reduce the development and maintenance costs for each firm. It also would let Ameritech provide features such as single-point-of-contact ordering and billing for customers with operations in several states.

"We are going to try to tie this investment in technology, this resource, to the business plans of all the Ameritech companies," Applied Technologies President Glen Arnold said. He said the first common system to go on-line will be a payroll system in which another subsidiary, Ameritech Services, initiated work. That implementation is scheduled for January.

Arnold said Applied Technologies will play the same role as an outside consultant who gets a set of requirements from an operating company, one of the nonregulated enterprise groups or Ameritech Services, which acts as a research arm for the operating companies. Applied Technologies would then design a system to meet those requirements and acquire the hardware. The internal Ameritech customers would take title to any systems for which they paid.

While systems planning and development and equipment acquisitions will be managed by the new subsidiary, the telephone companies will operate the systems with their own staffs.

Officials said it is unlikely that the new venture will seek customers outside of Ameritech, although it is taking over management of at least one small software subsidiary.

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Henson steps down at Prime

GE Information Services veteran tabbed as next CEO

BY NELL MARGOLIS
CW STAFF

NATICK, Mass. — Prime Computer, Inc. offered up a shocker with last December's $435 million Computervision Corp. takeover. Last week, the company delivered another surprise — this time, a changing of the guard.

Joe M. Henson, the 55-year-old chief executive officer who piloted Prime through its growth from a "hot-box company" to a computer-aided design and manufacturing player second only to IBM, will step down sometime during the next several months.

Henson, who said that he has no current plans beyond taking a long vacation and spending time with his family, will be replaced by Anthony L. Craig, a 17-year IBM veteran most recently credited with turning around General Electric Co.'s GE Information Services, which he headed from 1983 until last month.

Forewarned

According to Prime Chairman David J. Dunn, Henson told the board of directors last year that he wanted to leave sometime this year, and a search for a successor began.

The successful courtship of Craig, a Prime spokesman said, triggered the timing of Henson's public announcement of his imminent departure. Henson, who will resign as a Prime director when he leaves his post, has committed to remaining with the company for the next few months to assist with a smooth transition. Craig, who is already aboard, will serve as chief operating officer, executive vice-president and board member during the interim before taking on Henson's titles of president and CEO.

Anthony L. Craig

David Wu, an analyst at S. G. Warburg & Co., praised Henson's performance at Prime but also voiced disbelief that Henson, who served at IBM for 17 years before taking on the top job at Prime in 1981, is leaving of his own volition at this time.

To begin with, Wu said, the idea that Henson preannounced his departure last year is incredible in light of subsequent events. "I don't believe that the board would have let a lame-duck president go out and spend $435 million on the most critical move in the company's history," he said.

What is more, Wu said, digesting Computervision has proven a longer, harder and costlier challenge than Prime originally anticipated, and the settling-in period is not over yet. The company recently warned that its third-quarter earnings will fall short of the $15.9 million logged for last year's comparable period.

Out of character?

"For Henson to quit now, with his mission only partly accomplished, would be nothing short of irresponsible," Wu said, "and Joe Henson is not irresponsible."

Prime spokesmen denied that Henson was forced out.

"We regret his decision to pursue other interests and are indebted to him for the fine job he has done as CEO," Dunn said in a prepared statement. "Under Joe's leadership, Prime has grown from $365 million in revenue to $1.6 billion today and has been widely regarded as one of the best-managed companies in the industry."

Joe M. Henson

In related news, Prime adopted two provisions last week to guard against ill effects from any attempt at a hostile takeover. A new stockholder-protection plan effectively increases the cost of an unfriendly takeover by providing for the issue of a dividend of one share-purchase right per each outstanding common share in case of a change in company control not approved by the board.

An employee protection plan confers certain benefits on Prime employees who lose their jobs, salaries or level of benefits in the course of an unfriendly takeover.

Unisys A machines tweaked

BY JEAN S. BOZMAN
CW STAFF

DETROIT — Unisys Corp. souped up three entry-level A series mainframes last week to meet — or beat — IBM's Application System/400 price/performance curve.

The enhancement comes just one year after the introduction of the A 1, A 4 and A 6 entry-level A series mainframes.

The enhanced A 1 FX, A 4 FX and A 6 FX, scheduled for shipment next month, were designed to compete in bidding wars against the IBM mid-range AS/400, said Michael C. Deneen, program marketing director of the entry-level A series. A dual-processor A 6, the A 6 KX, rounds out the line.

"This is a move to continue the momentum we've had in the last year in selling these machines to new customers," Deneen said.

He did not provide the number of small A series systems Unisys shipped last year.

Taking the IBM challenge

Unisys utilized IBM's RAMP-C benchmark to tout its "X" models as superior to the IBM AS/400 line

Model	Transactions/Hr.	Cost
A1 Model FX	12,670	$45,000
AS/400 Model 30	10,000	$40,500
A4 Model FX	20,084	$65,000
AS/400 Model 40	16,000	$87,500
A6 Model FX	27,358	$115,000
AS/400 Model 50	23,000	$171,500
A6 Model KX	52,491	$210,000
AS/400 Model 60	38,000	$284,500

SOURCE: UNISYS CORP.

The new computers range in price from $45,000 for the A 1 FX to $210,000 for the dual-processor A 6 KX. The A 1 FX supports about 20 users, while the dual-processor A 6 KX can support up to 96 users.

Who gets them

The systems are aimed at three types of customers, Deneen said: new customers, customers who already own other A series mainframes and owners of smaller Unisys systems, including the B 1000.

For those who own a large-scale A series machine, the smaller A series computers can be used as test and development machines, Unisys said.

Unisys compared the A series computers to the AS/400, using IBM's Ramp-C benchmark (see chart). "We think we're performing about 20% better than IBM does in Ramp-C," Deneen said.

Price/performance boost

The new machines are positioned to offer more power at the same price or equivalent power at less price than the earlier models, Deneen said.

"We're keeping up with the aggressive pricing scheme of the AS/400," he said, adding that IBM itself had recently repositioned the IBM 9370 against the AS/400.

Field upgrades from the low-end A 1 Model F up to the A 6 KX model are available to owners of the older A series machines, Unisys said.

Intel profit bucks fears

SANTA CLARA, Calif. — Intel Corp., riding the 80386 tide that is lifting its boat far above its competitors, last week reported another strong quarter of earnings and revenue growth.

Profits for the third quarter ended Sept. 26 leapt 77% from year-earlier levels to $143 million, or 78 cents per share. Revenue increased 57% to $785 million, a record high for Intel.

Intel's surge comes amid warning signs from the Semiconductor Industry Association (SIA) that tough times may be returning for the U.S. chip industry. The SIA, traditionally known for rosy growth forecasts, predicted that the industry will decline 3% in 1990 (see story page 123).

But Intel's biggest problem at the moment is meeting demand for the 80386. Intel President Andrew Grove said that supply "appears to have caught up with demand" for the high-performance microprocessor. He did note, however, that overall chip orders from Intel declined from its record second-quarter levels, particularly in North American and European markets.

CLINTON WILDER

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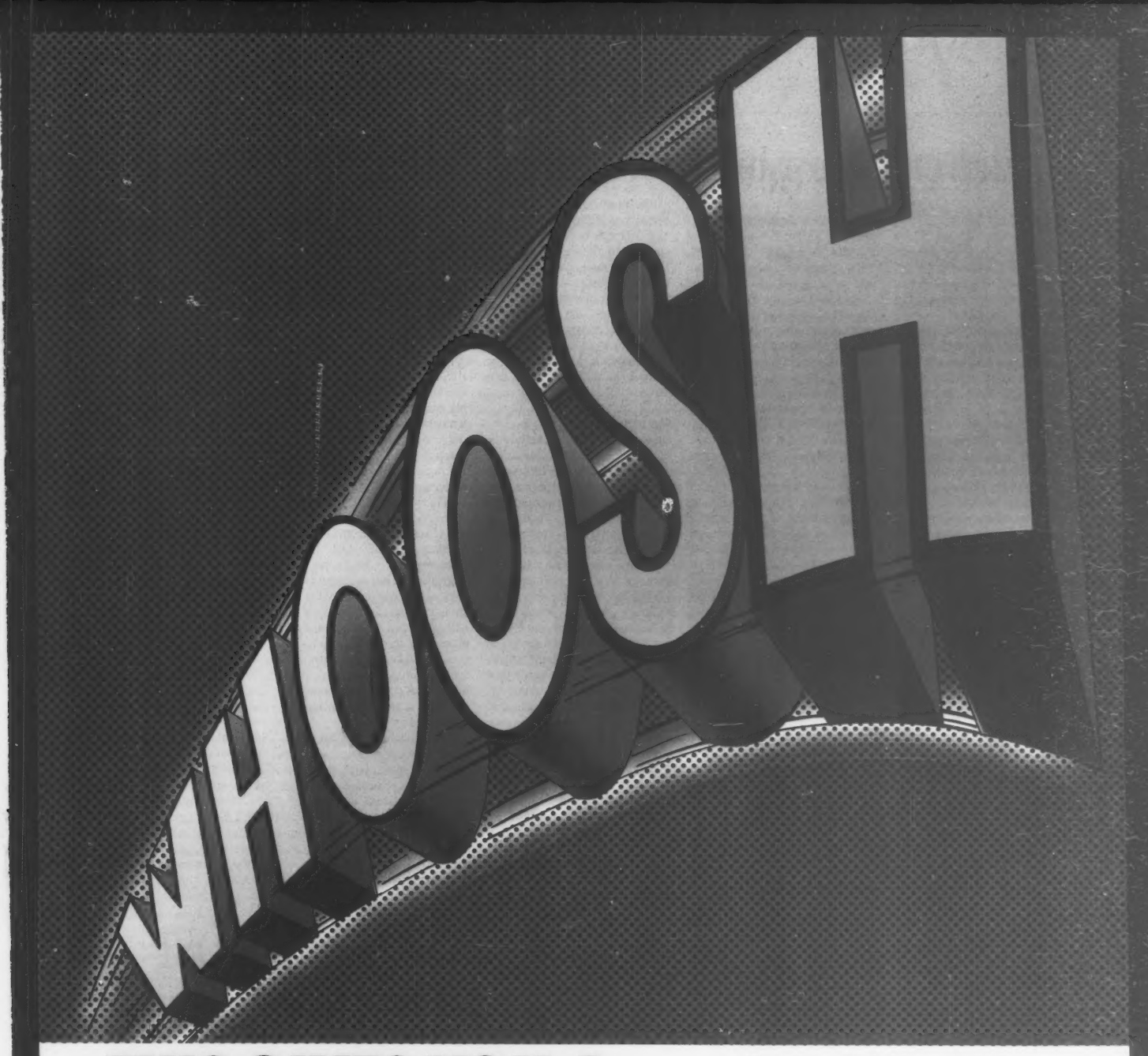

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DG high end soars, but is it enough?

BY ROSEMARY HAMILTON
CW STAFF

NEW YORK — Data General Corp. last week came out fighting with a high-end system that flies above the price/performance of Digital Equipment Corp.'s high end.

The company rolled out its long-expected MV/40000 and MV/40000-High Availability (HA) line and said it already had $30 million in orders lined up. But observers said this new high-end system will have to do much more than that to pull the minicomputer maker out of its quagmire of financial woes, layoffs and plant closings.

"It's an excellent product," said Steven Widen, an analyst at TFS, Inc. in Westford, Mass., but he questioned DG's ability to compete with IBM and DEC. "That has always been the crux of DG's problem," he said.

The systems, which begin with a 14 million instructions per second (MIPS) uniprocessor model and expand to a 50 MIPS quad-processor configuration, will be targeted at commercial users with heavy on-line transaction processing and database requirements, the company said. DG said shipments start at the end of this year.

DEC's high-end systems, introduced in March, are also targeted at commercial environments and expand to a quad-processor configuration as well. The MIPS range, however, is estimated at six to 22.

"We are very impressed," said William Buriak, assistant vice-president of information systems at Beneficial Financial Corp. in Peapack, N.J. "It matches the goals that we've been striving for."

Beneficial currently runs three MV/20000, six MV/10000 and several other DG systems, according to Buriak. He said he expects the company to commit to the new systems in the near future, although a date has not been set.

However, Buriak added, the announcement did not rid him of concerns about the company's financial health. "We don't think they're going away tomorrow, but obviously we have concerns."

Going commercial

DG pointed to a number of features being introduced with the product line that will help it sell in high-volume commercial settings. These include an upgraded operating system, a high-speed channel subsystem and a separate diagnostic processor.

DG's introduction included five processors. One, the MV/40000, an extension of the company's MV line, is scheduled to begin shipping by the end of this year. The other four make up the HA line, which is scheduled to begin shipping in the first quarter of 1989. The HA line departs from the MV series in that it offers more mainframe-like features but remains compatible with existing MVs, the company said.

The HA line is based on the symmetrical multiprocessing technology first introduced by DG with the MV/20000 in 1985.

The systems were named High Availability because they have some, but not all, fault-tolerant characteristics. DG said the company did not want to go all the way with fault tolerance because it would have resulted in a much more costly system. The entry-level HA model has a starting price of $595,000, and the high-end Model 4 costs $1.5 million.

The upgraded release of AOS/VS is intended to exploit the HA environment, but it can be used on all MV systems, the company said. With the new AOS/VS, DG introduced its data-sharing architecture, which is similar to the client-server model that several other vendors are now using in database management environments. With this architecture, a single MV/40000-HA could function as the server in a network of other clients' MVs.

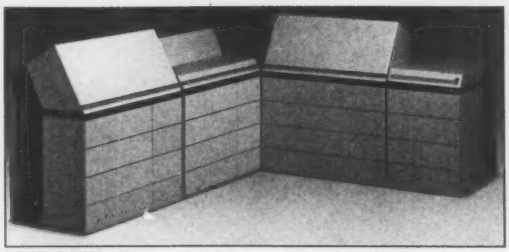
A new channel subsystem will reportedly offer speeds of up to 400M byte/sec. With the Message-Based Reliable Channel (MRC) subsystem, if a peripheral fails, a systems operator can configure around the failed component until it is repaired, according to DG.

DG said the MRC subsystem is suited for the data-sharing architecture because it would offer the high-speed response time needed in a database environment. It is not a requirement, however, the company said.

Last week's announcement was the latest step in DG's two-pronged strategy, according to company executives. Recognizing that the traditional minicomputer market would no longer provide an adequate growth rate, DG said earlier this year that it would enter the Unix market full tilt with a system based on the Motorola, Inc. reduced instruction set computing 88000 microprocessor. That system is set to appear next year.

"This is an impressive announcement," said Michael Geran, vice-president of research at Nikko Securities International in New York. "But they are going to need a big revenue stream from this product to improve things."

Nonetheless, Geran noted that DG could do a good business selling to its installed base alone. Since 1980, DG has sold 27,000 MV systems, according to Edson de Castro, the company's chief executive officer.



MV/40000-HA *has a slant-top peripherals cabinet*

Battle for the bucks

Data General trumpets price/performance edge of its MF/40HA line over DEC's VAX 8800 series

	List price	MIPS	Cost per MIPS
DG MF/40HA-1	$517,000	14	$37,000
-2	$869,000	27	$32,000
-3	$1,167,000	40	$29,000
-4	$1,425,000	50	$29,000
DEC VAX 8810	$541,000	6	$90,000
8820	$783,000	11	$69,000
8830	$1,058,000	17	$63,000
8840	$1,354,000	22	$61,000

SOURCE: DATA GENERAL CORP.

Lotus delay

FROM PAGE 1

Diasparra predicted.

Lotus Chairman Jim P. Manzi argued that Release 3.0 and the multiplatform era it ushers in is well worth the wait. "We aren't seeing a whole lot of teetering going on," Manzi stressed in an interview last week. Lotus' sales force has met this year with some 370,000 customers to pitch 3.0 and reports no wholesale shifting toward other products, Manzi claimed.

Like earlier delays, Release 3.0 is being pushed back because of product bugs and the sheer bulk of code. To be competitive, Lotus not only needs to squeeze the product into Microsoft MS-DOS's 640K-byte confines but needs to provide an adequate measure of work sheet space. King declined to say how much work sheet space Lotus is looking to provide.

The firm is converting between 5% and 8% of the product from the C language to assembler to improve performance and trim the size, said Frank King, senior vice-president of the Software Products Group.

The question remains: Can today's 1-2-3 stand the test of time? Already, half of the U.S.'s Big Eight accounting firms have switched, in some measure, to Excel running on either the IBM Personal Computer or the Macintosh.

Further, Microsoft could get the go-ahead run if Touche Ross & Co. changes its tune. Up until now, Touche Ross appeared to be solidly behind Release 3.0. But a six-month delay, coupled with the news that users need an Intel Corp. 80286-based machine to achieve adequate performance, may change everything.

"This will cause a reconsideration," said G. Jeffrey Knepper, director of advanced technology-tax at Touche Ross.

The main stumbling block to moving his firm to Excel is the $1,000 a pop it takes to upgrade a personal computer's graphics so it can run Excel effectively, Knepper said.

When it rains

So far, Lotus has avoided major customer defections. But once these begin, they may be impossible to stop. "This is a high risk for them. Once the movement begins, the trickle turns into a flood," Knepper said.

To shore up 1-2-3 sales, Lotus has announced a free upgrade to Release 3.0 for new customers; a special deal that gives customers a free copy of Allways, a spreadsheet publishing program from Funk Software, Inc.; and a $15 utility disk that removes copy protection and adds intelligent recalculation, macro recording, high-resolution graphics and printing support.

The firm will continue to follow this approach to enhancements and may even crank out a new version of today's 1-2-3 positioned just below Release 3.0, Lotus officials admitted. In fact, 1-2-3 Release 2.01 continues to win rating awards from PC publications and recently gained top honors from *Software Digest's* ranking of spreadsheets.

To maintain, or some say regain credibility, Lotus has to prove that Release 3.0 is real and worth waiting for. Something as simple as a beta release could help matters.

"They have to push that beta out. Then there is some reality associated with it," Knepper said.

AT&T answers OSF with advisory group

BY AMY CORTESE
CW STAFF

An independent group of AT&T Unix System V licensees and resellers is being formed to advise AT&T on product marketing issues.

The group is AT&T's answer to criticism that led to the formation of the Open Software Foundation (OSF), sources involved in the group said last week. As keeper of Unix System V, AT&T has been charged with not being responsive to licensees of its operating system.

AT&T initiated the group several months ago but has turned it over to the licensees to be run independently. The group is still in the process of being formed, and bylaws and objectives are being established. The unofficial charter of the group is to provide input to AT&T on issues regarding System V, such as licensing policies.

The formation of the advisory group does not mean AT&T will not join OSF, according to Roger Sippl, president of Informix Software, Inc. and acting chairman of the group. "Regardless of whether AT&T joins, they will still be doing future development on System V," he said, adding that AT&T recognizes it needs to communicate more and be more responsive.

The group's constituency will be companies that license and resell Unix System V, which Sippl estimated at 200 to 300 companies. This would include virtually all of the OSF's membership — and the OSF itself.

About 20 companies have been represented in recent meetings, including Apollo Computer, Inc. — one of the founding members of the OSF — Unisys Corp., Convergent Technologies, Inc., Pyramid Technology Corp., HCR Corp., Oracle Corp. and Informix.

AT&T officials could not be reached for comment.

The many hats of Oracle

As firm takes on more roles, users ask: What price growth?

BY AMY CORTESE
CW STAFF

ORLANDO, Fla. — Oracle Corp. no longer bills itself as merely a database management system supplier but rather as a software and services company. The firm even sees a possible future for itself as a hardware supplier.

Like a snowball barreling down a steep hill, Oracle continues to pick up speed, grow in size and gain momentum. But as 3,000 customers overran the company's annual users' conference here last week, many were asking: What price growth?

Oracle users expressed a refrain familiar to many a fast-charging company — that support could suffer as a result of escalating staff requirements. Many relayed stories of rookie support and field staffers unable to answer technical questions.

One database administrator at a Canadian IBM MVS site said a new Oracle employee showed up to install the DBMS but forgot to install the data dictionary. A user at a midsize distribution firm exclaimed that he was "tired of training Oracle's people" when it comes to technical support.

While declaring that the $10 billion revenue mark is not an inconceivable goal for the near future — the company's latest mark was $282 million — Larry Ellison, Oracle's chief executive officer, acknowledged that staffing is really the key issue.

Can't eat just one

Nevertheless, Ellison indicated that Oracle intends to go even further afield. He said the company is likely to get into the hardware business by selling commodity hardware along with its software — when it makes sense to do so.

In June, the company founded Oracle Complex Systems Corp., a wholly owned systems integration subsidiary with a lofty revenue goal of $100 million in five years.

The company indicated it sees big things ahead in the hardware business. Ellison dropped hints that he has a project in the works involving a high-performance database machine, likely a parallel processor.

Running Oracle, it would boost the database software's performance 10 to 100 times, Ellison said. Such a deal could explain Ellison's opening remarks that Oracle will reach 1,000 transaction/sec. by the end of 1989.

The company has a tradition of exceeding industry expectations. It has doubled its revenue growth every year for the past 10 years. It adds new employees at the rate of more than 100 per month.

To achieve this kind of growth, Oracle has broadened the scope of its business from DBMSs, tools and services to include financial applications, systems integration and distributed office automation.

Oracle used the annual conference to highlight some of these areas. An electronic mail system, which the company claims is the only portable E-mail system, was demonstrated. According to Ron Wahl, the firm's vice-president of office automation, the E-mail sytem will be integrated with the Oracle DBMS and financial applications and will form a backbone system for communications. Oracle Starmail, as it is called, will be formally announced next month and will be priced at 50% of the DBMS' price, depending on platform, according to Oracle.

But the majority of customers at the conference seemed to be interested in database issues and lukewarm to new forays like applications and E-mail. Most said they already have such systems and need a good reason to switch.

Richard Winter, a comptroller at ATD-American Co., a distributor of textiles and furniture in Wycote, Pa., said he looked at Oracle's E-mail and accounting software but found that "the facilities we've developed to handle these things are already working."

ATD uses a packaged general ledger system it has modified and Digital Equipment Corp. Vaxmail along with the Oracle DBMS to handle functions like automatic letter generation. "I'm not convinced people will jump off what they're doing," Winter said.

Oracle Version 6 is scheduled to become generally available next month, and much time was devoted to expounding on the performance improvements it will bring. However, many users were unhappy about the price.

Although one iteration of Version 6 is set to be available in January as a free upgrade under the maintenance contract, a high-performance option will be costly.

The Transaction Processing System (TPS) option will cost large-system users as much as the full price of the DBMS; the price for medium-scale systems is set at 40% to 60% of the DBMS's price; for small systems, it is set at 20%.

Oracle officials said they are charging for the TPS option because they did not want to force all users to pay for something that only some will need.

But to some users, performance is not the only issue. The optional TPS also includes other features that plain-vanilla Version 6 will not — such as PL/SQL, which is Oracle's procedural extension of SQL.

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BIG.CLUSTER.INDEX	55	402802
A.FILE.SMALLER	16540	679216
A.FILE.SMALLER.DATA	16500	270501
A.FILE.SMALLER.INDEX	40	408715
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NEWS SHORTS

Pirate hunt forms

Top microcomputer software competitors Ashton-Tate Corp., Lotus Development Corp. and Microsoft Corp. are among the founding members of the Business Software Association (BSA). The industry group, which is scheduled to be formally announced Oct. 11, also includes Aldus Corp., Autodesk, Inc. and Wordperfect Corp. The association aims to combat international software piracy, promote strong intellectual property laws and reduce trade barriers. Those goals are also espoused by the Software Publishers Association (SPA), a group with membership that includes five of the six firms (the exception is Aldus, which was previously an SPA member). "We hope to cooperate with them so as not to compete for the same funds," said Cheryl Davis, membership director of the SPA, who questioned the need for another association.

CIS feels leasing pinch

Cutthroat competition in the computer leasing industry (see story page 1) continues to affect the bottom lines of computer lessors. Continental Information Systems Corp. (CIS), the second largest independent lessor, last week reported its second consecutive quarterly loss, the layoff of 75 employees and the refinancing of its short-term debt. CIS reported a $2.7 million loss on the heels of a $7.5 million loss in the previous quarter. The layoffs will affect employees from the former CMI Corp. in Bloomfield Hills, Mich. CIS acquired CMI last year.

President gets matching bill

The U.S. Congress last week gave its final approval to legislation that will regulate federal computer-matching programs that compare personal data files [CW, Sept. 5]. The House vote was 393-8, sending the Computer Matching and Privacy Protection Act to President Reagan to be signed into law.

US West stays put

After threatening for 18 months to withdraw from Bellcore, US West officially decided last week to retain its membership in the jointly held consortium that does research and helps ensure product conformity among all seven regional Bell holding companies. US West had first objected to the prohibition against members funding independent, proprietary research through Bellcore, a spokesman said. That situation changed in January, when a new agreement took effect allowing a member to fund independent research and keep it proprietary for up to two years, after which it must be made available to all seven members.

Novell backs away from hardware

Distancing itself even further from the hardware end of the networking business, Novell, Inc. in Provo, Utah, has unveiled a royalty license agreement with Federal Technoloy Corp. (FTC). Under the pact, effective immediately, FTC will supply and support Motorola, Inc. 68000-based products for Novell customers. This includes Novell's 68B file server and related components. Also, FTC will acquire Novell's inventory of 68000-based products along with the exclusive rights to manufacture them. Novell pulled off a similar deal with its diskless workstations, which are now being manufactured and serviced by Samsung Semiconductor, Inc.

MSA wins IBM favor

Management Science America, Inc. (MSA) last week announced agreements with IBM to cooperatively market MSA products in two growth markets. The Atlanta-based software firm said it has been designated by IBM as an "Authorized Application Specialist" in the DB2 environment and the electronic data interchange (EDI) market. Claiming to be the first to beta-test a DB2-based application, MSA said its general ledger and expert reporting products for DB2 became generally available Sept. 1 and that all future products will be able to take advantage of IBM's relational database management system. MSA's Expert EDI system will be marketed as a gateway to IBM's Information Network.

Allies seek standard

Net management vendors to shoot for interface

BY KATHY CHIN LEONG
CW STAFF

A handful of vendors, anxious to see a standard user interface developed for network management, have decided to form their own vendor alliance even though the OSI/Network Management Forum exists.

According to Timeplex, Inc.'s Paul Lu, a member of the current forum, the OSI/Network Management Forum will probably not be addressing the issue of a standard network user interface; instead, he commented, it is focusing on the development of lower layer protocols.

For that reason, frustrated vendors, including Hewlett-Packard Co. and Ungermann-Bass, Inc., have decided to form the Network Management Alliance. Other interested vendors include Honeywell Bull, Inc. in France, Siemens AG in West Germany and British Telecom, Inc. in London. "We are still finalizing our missions statement, member fees and other administrative issues," one source said.

According to sources at UB and Codex Corp., the group is still in its formative stages but has decided to address the International Standards Organization's Open Systems Interconnect (OSI) network management standards in applications development and user interfaces.

Complementary group

The source stressed that the group will not compete with the OSI/Network Management Forum but will, rather, be a complementary organization. "We will adopt the other group's protocols that they develop," the source said.

The OSI/Network Management Forum was officially launched in July by members of the computer and communications industry to further the availability of OSI-based network management products and services. Its initial goals include lower layer protocol handling such as messaging, object definition and the OSI's Common Management Information Protocol.

Lu said he has heard rumors about the formation of the group. He said his forum would not have discussed the issue of a standard user interface because "that may be a company's way of differentiation. I doubt that all vendors would want to make this a standard."

But the alliance wants to further applications development so users can see the day when network management applications have a similar look and feel.

The group wants to push forward in its desire to standardize a user interface. Of the vendors involved, HP is the only one that has a graphically oriented user interface, via its Openview network management architecture.

"Someday, users will access different applications but face a similiar screen and icons. You could click a UB icon and know what to expect. You could click an HP icon and it could have the similar screen format. That would be a major step forward," a UB source said.

Having a similar interface in network management will allow users to deal with similiar parameters for messages, alarms and alerts, the source said.

IBM

FROM PAGE 1

be stored on 20 IBM 3380 Model K disk drives.

IBM made several other software and hardware announcements:

- An Enterprise System/3090 Model 250S, made up of two Model 150S processors. The product is set to be available in the second quarter of 1989.
- VM/XA System Product Multiple Preferred Guest software, which allows up to six preferred guests to run on all ES/3090 models when used with Processor Resource/Systems Manager (PR/SM), a hardware feature that allows logical partitioning. Logical partitioning allows a single processor to simultaneously support multiple operating systems.

Multiprocessor ES/3090 models running VM/XA can gain up to 12 multiple preferred guests by dividing the processor into two sides.

Previously, VM/XA and PR/SM could support as many as four multiple preferred guests. According to IBM, the capability to support six guests was included in the previous version of VM/XA and PR/SM but was not announced to users because it had not been thoroughly tested. No hardware or software changes were made to provide the new capability.

- An increase from four to six of the number of logical partitions available through PR/SM on some ES/3090 S models not running VM/XA. Those models are the 180S, 280S, 200S, 300S, 400S, 500S and 600S.

All ES/3090 E models and ES/3090 S Models 120S, 150S and 250S not running VM/XA are limited to four logical units under PR/SM.

Multiprocessor ES/3090 S models not running VM/XA other than the Model 250S can gain up to 12 logical units by dividing the system into two halves.

- Productivity enhancements for SQL/DS, a VM and VSE DBMS, and Query Management Facility, software that helps computer users get information from a relational database and write reports. Both are expected to be available in December.

> "IBM IS making a big splash of distributed capabilities."
>
> DALE KUTNICK
> CONSULTANT

"IBM is making a big splash of distributed capabilities, but it is only data sharing between two DB2 systems. There is no capability for sharing with the AS/400, for example," said Dale Kutnick, an independent consultant based in Redding, Conn.

"It's a major breakthrough for IBM," said Rich Finkelstein, president of Performance Computing, Inc. in Chicago. "This is somewhat equivalent to what [Relational Technology, Inc.'s] Ingres relational database has already."

Russell Donovan, database support marketing manager at IBM, described the capability as a multilocation read. He was careful to point out that the ability to do a multilocation update is not yet offered. Neither is the ability to perform a join between two DB2 databases.

Nonetheless, Finkelstein explained, multilocation reads will save much work compared with what is required at present. Currently, data would have to be extracted from one region, brought to another and then subjected to a query. "It is a troublesome and time-consuming process," he said.

To assure the integrity of data across systems, changes to databases will be allowed only if an entire transaction can be completed successfully. For example, money could not be withdrawn from one bank account for deposit in another unless both actions could be completed successfully, Donovan explained.

Kutnick predicted that by late 1990, IBM will offer a fully distributed version of DB2 but that it will not be until 1992 that IBM will deliver a fully distributed database across OS/2-based microcomputers, Application System/400 mid-range machines and mainframes.

DB2 Version 2 Release 2 will be priced at a graduated one-time charge ranging from $108,000 to $223,550 or a graduated monthly license charge ranging from $3,060 to $4,140.

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Toshiba, NEC lead the laptop parade

BY JULIE PITTA
CW STAFF

October is fast becoming the month of the laptop.

Toshiba America, Inc. and NEC Home Electronics USA, Inc. last week bolstered their personal computer lines with a slew of laptops. IBM and Compaq Computer Corp. are expected to follow suit with portables of their own in coming weeks.

Laptops are finding their way into a number of corporations for use in field organizations requiring portable systems, according to industry analysts. In that specialized corner of the PC market, Zenith Data Systems and Toshiba are considered the two leading vendors.

"Toshiba and Zenith have the lion's share of the Fortune 1,000," said Tom Young, an industry analyst at Computer Intelligence, a San Diego market research firm. "Zenith has had overwhelming success in the government sector."

Toshiba's popularity has been based on the range of its laptop offerings, Young said. The American subsidiary of the Japanese conglomerate was the first to offer an Intel Corp. 80386-based laptop and the first to offer hard disk drives as an option for its laptops. Zenith has been a leader in screen technology; it was the first vendor to offer backlit screens on its laptops, he added.

Toshiba America, however, has lost government sales to Zenith because its parent, Toshiba Corp., has been shut out of that market for three years, after selling of equipment to the Soviet Union [CW, Sept. 26].

Last week, Toshiba added a battery-powered Intel 80286-based laptop and a 386-based laptop as part of its AC-powered line. Called the T1600, the 286-based portable weighs 11.6 pounds. It runs at 12 MHz and offers 1M byte of random-access memory, expandable to 5M bytes. Additionally, it offers an Intel 80287 coprocessor and a 20M-byte hard disk drive.

The screen is detachable, uses backlit supertwist technology and is compatible with the IBM Enhanced Graphics Adapter. Set to ship early next year, the system costs $4,999, the vendor said.

Toshiba also introduced the T5200, its second 386-based AC-powered laptop. The system features more power, memory and disk storage than its predecessor.

The T5200 has 2M bytes of RAM, which is expandable to 8M bytes, runs at a clock speed of 20 MHz and offers an IBM Video Graphics Array-compatible display system. The screen uses gas plasma technology. The system weighs 18.7 pounds.

The T5200 will be offered in two models, Toshiba said: one with a 40M-byte hard drive, priced at $9,499, and a second with a 100M-byte hard drive, priced at $10,999. It is scheduled to be available later this year.

> "TOSHIBA AND Zenith have the lion's share of the Fortune 1,000."
>
> TOM YOUNG
> COMPUTER INTELLIGENCE

NEC introduced three battery-powered laptops: a 4-pound system the vendor called the most compact on the market and 286- and 386-based models intended to broaden what has been considered a low-end line.

The 4-pound laptop, called the Ultralite, features a NEC V-30 processor running at 9.83 MHz. It offers 640K bytes of RAM, an internal 2,400 bit/sec. modem and a backlit screen. It supports IBM Color Graphics Adapter text and graphics.

Additionally, it offers a 1M- or 2M-byte silicon hard disk drive and a read-only memory card drive. The price of the system is $2,999.

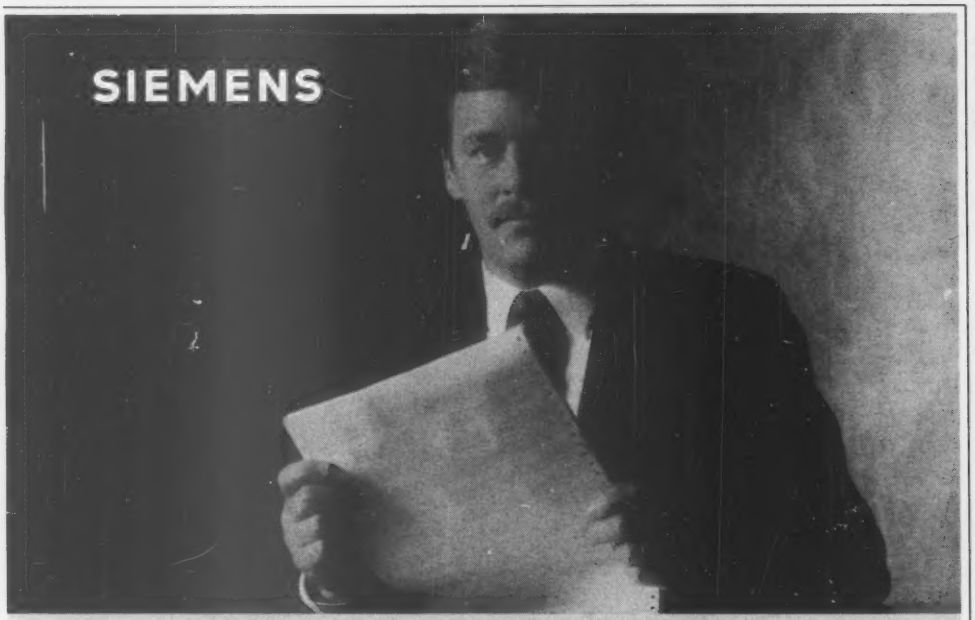
NEC also bolstered its line with the Prospeed 286 and 386 systems. The Prospeed 386 runs at 16 MHz, offers a choice of a 40M- or 100M-byte hard disk drive and has three expansion slots. The Prospeed 286 features 1M byte of RAM, runs at 16 MHz and offers the choice of a 20M-, 40M- or 100M-byte hard drive.

According to NEC, the Prospeed 286 will be priced at $5,000 and will be available in February 1989; the Prospeed 386 will be priced at $7,699 and will be available next month.

Compaq is expected to introduce a 286-based laptop at a press conference scheduled for Oct. 17 in Los Angeles. Computer Intelligence's Young predicted Compaq will quickly add a 386-based laptop to its line.

IBM is expected to follow Compaq with 286- and 386-based versions of its PC Convertible. Young said he expects IBM to improve the Convertible's screen using supertwist backlit technology and to add 20M- and 40M-byte hard drives as options.

However, neither company is expected to improve on the technologic advances of industry leaders Toshiba and Zenith. "Unless they have something up their sleeves, I expect that they'll introduce systems to compete more effectively with Toshiba and Zenith," Young said.



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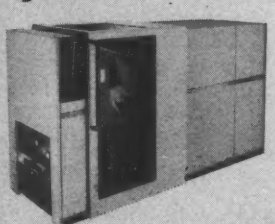

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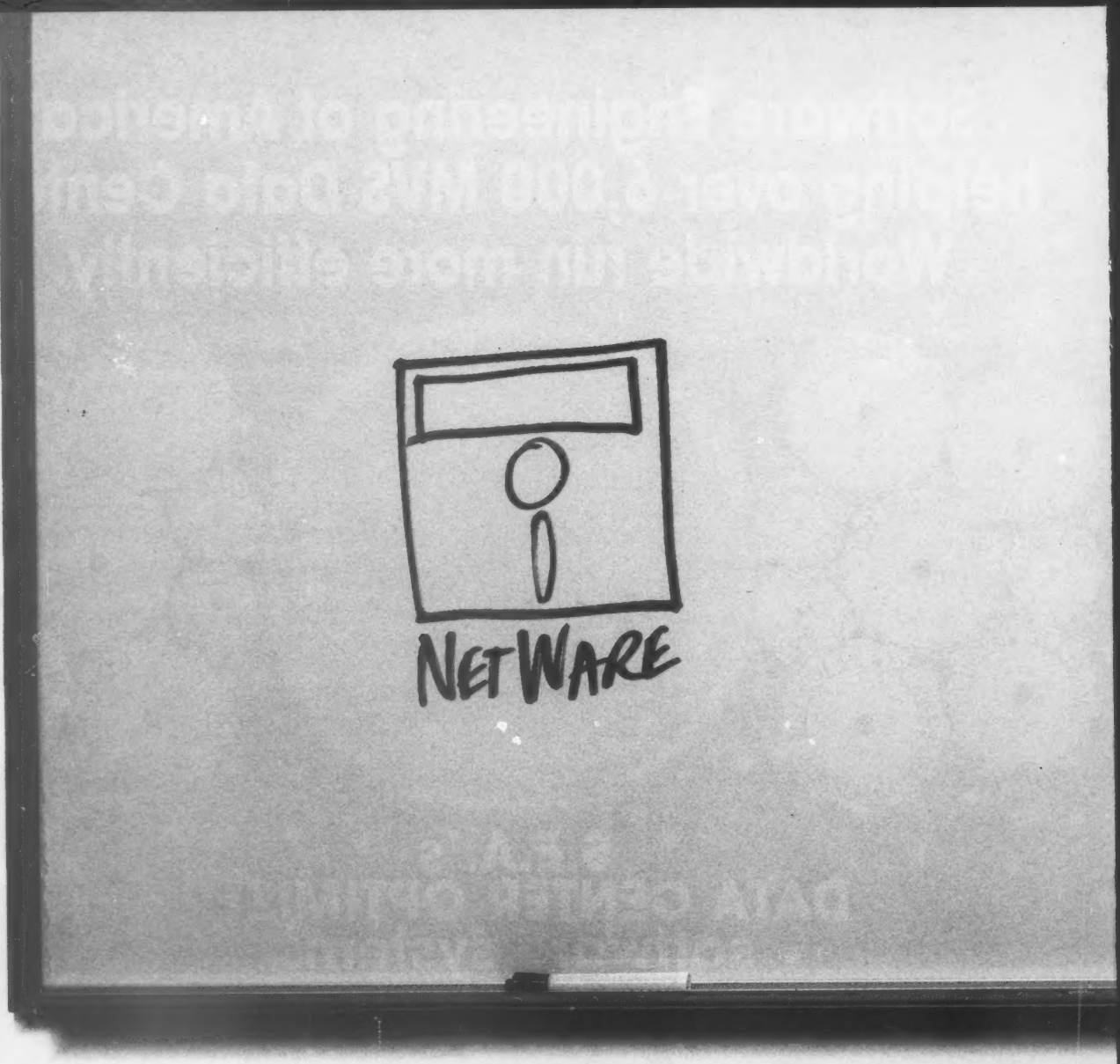

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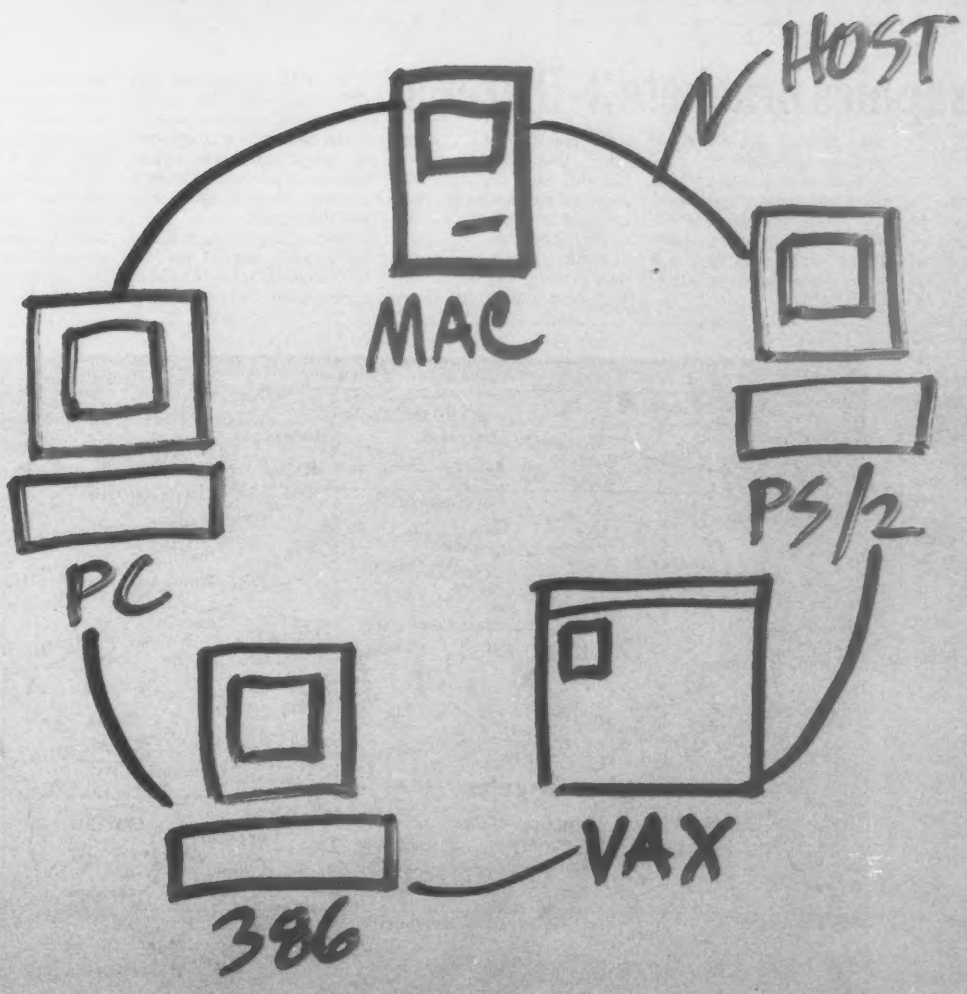

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Silicon Graphics brackets 3-D arena

BY NELL MARGOLIS
CW STAFF

MOUNTAIN VIEW, Calif. — Silicon Graphics, Inc. hit the workstation market high and low last week with the simultaneous announcements of a new top-of-the-line series and a superpowerful entry-level model.

The Iris Power Series — a six-system server and workstation offering — marks the company's entry into the sizzling minisupercomputer workstation niche. The Personal Iris, a real-time three-dimensional personal workstation priced at less than $16,000, provides a low-cost entry point to Iris Power.

"Silicon Graphics now offers an [exceptionally] compatible line across a particularly broad spectrum of price and power," said Russell Crabs, an analyst at Gartner Securities Corp. in Stamford, Conn. "That's an impressive offer to make to potential customers."

Get those 3-D glasses

The Iris Power servers, Silicon Graphics said, are based on a new proprietary multiprocessing architecture; the three new workstations wed that architecture to the company's high-end 3-D graphics capability.

The Power systems, a company spokesman said, support as many as four reduced instruction set computing (RISC) CPU/floating-point unit chip sets and use Mips Computer Systems, Inc.'s latest and most powerful R3000 chips. They are able to kick out as much as 80 million instructions per second (MIPS) and 16 million floating-point operations per second.

The Personal Iris, also based on Mips Computer Systems technology — in this case, a 12.5 MHz, 32-bit RISC chip — delivers 10 MIPS with 8M bytes of main memory and a wallop of 3-D graphics clout, analysts said.

The company is counting on the Personal Iris to bring 3-D graphics visualization to a new class of users in traditional markets such as mechanical engineering, scientific research and industrial design and to open up new markets such as architecture, desktop publishing and computational graphics.

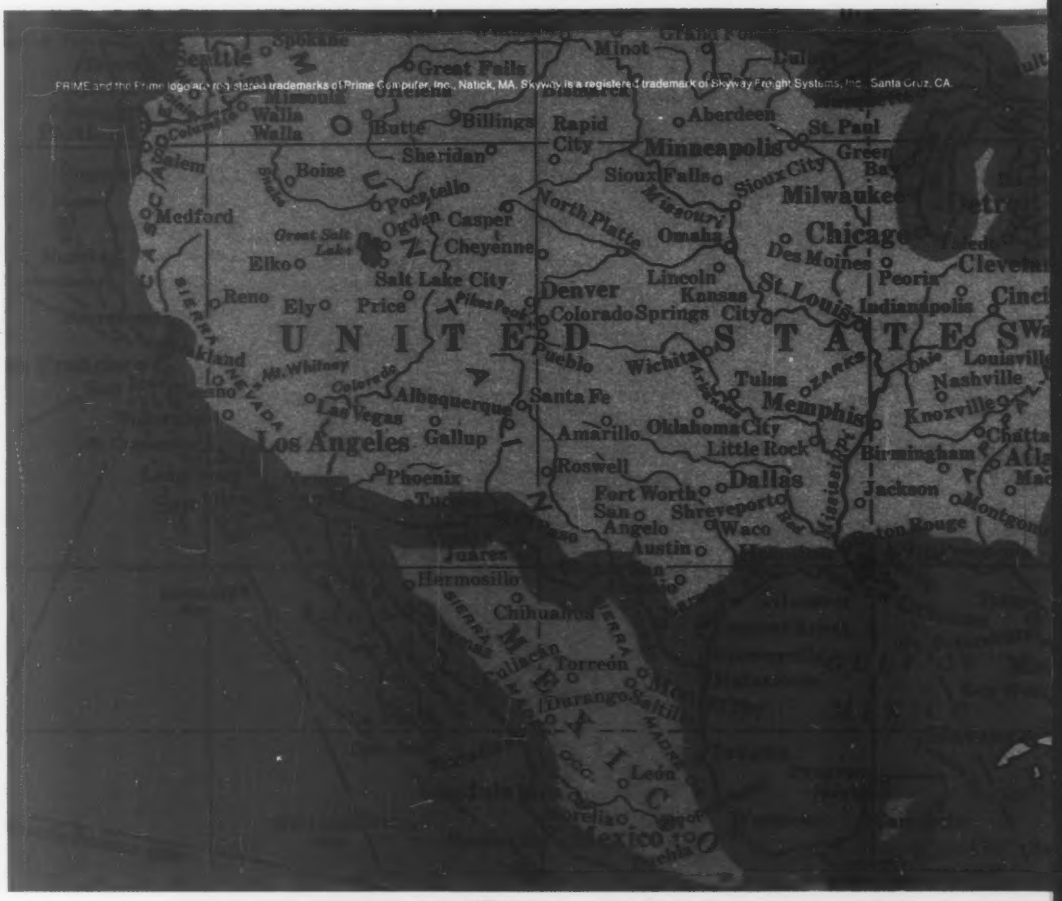
In more traditional areas in which only customers with fatter wallets have been able to benefit from supercomputer-level technology, the Personal Iris should be enthusiastically embraced, Crabs said.

Beyond its own technology, Silicon Graphics is touting the fact that more than 100 third-party software application packages are immediately available on the Personal Iris.

Among these are finite element modeling and analysis software from Milford, Ohio-based SDRC CAE International, Inc. The 20-year-old, $61 million software and services purveyor to the mechanical computer-aided design market will support only what it perceives as market-leading hardware, spokesman Jere Hunter said.

Silicon has "truly matured into a leading company, and with the Personal Iris, they now have quite a range. This is the kind of capability and flexibility that gives our customers the flexibility they need," Hunter said.

Meanwhile, Control Data Corp., Silicon Graphics' largest OEM, showed no doubt as to the anticipated reception of its workstation supplier's superbaby: Control Data's Personal Iris-based entry, the Cyber 910-400 series, debuted the same day as the Personal Iris.



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Wang marches into SAA camp

BY PATRICIA KEEFE
CW STAFF

LOWELL, Mass. — Marching under the IBM Systems Application Architecture (SAA) banner, Wang Laboratories, Inc. last week extended its drive into IBM connectivity with a promise to support IBM's Netview network management system.

Claiming that its offerings will exceed the capabilities of the IBM connectivity products recently unveiled by Digital Equipment Corp., Wang rolled out a statement of direction that clearly places it in the SAA camp.

Wang said it will focus its development resources on connectivity and integration products that comply with SAA common communications support.

"SAA compliance is an important part of Wang's overall strategy to support multivendor environments," said Paul Demko Jr., Wang's vice-president of Communications Systems Development.

Wang's Netview strategy calls for implementing Service Point System (SPS) functionality via a gateway that allows VS systems running Wang's network management system to deliver status and administrative data to mainframe-based Netview programs.

SPS is an intermediate device that enables systems to route alerts through the mainframe to Netview. Reportedly, the gateway will not require additional hardware.

Under that platform, Wang introduced five enhanced software products for its VS minicomputers and industry-standard personal computers. These include the following: Information Distribution System Release 2.5; VS/PC Systems Network Architecture (SNA) Services 3270 Release 1.1; VS SNA Standard Components Release 2.62, Wang Word Processing/Document Content Architecture Translators Release 2.5; and VS Systems Network Architecture Distributed Services Release 2.0.

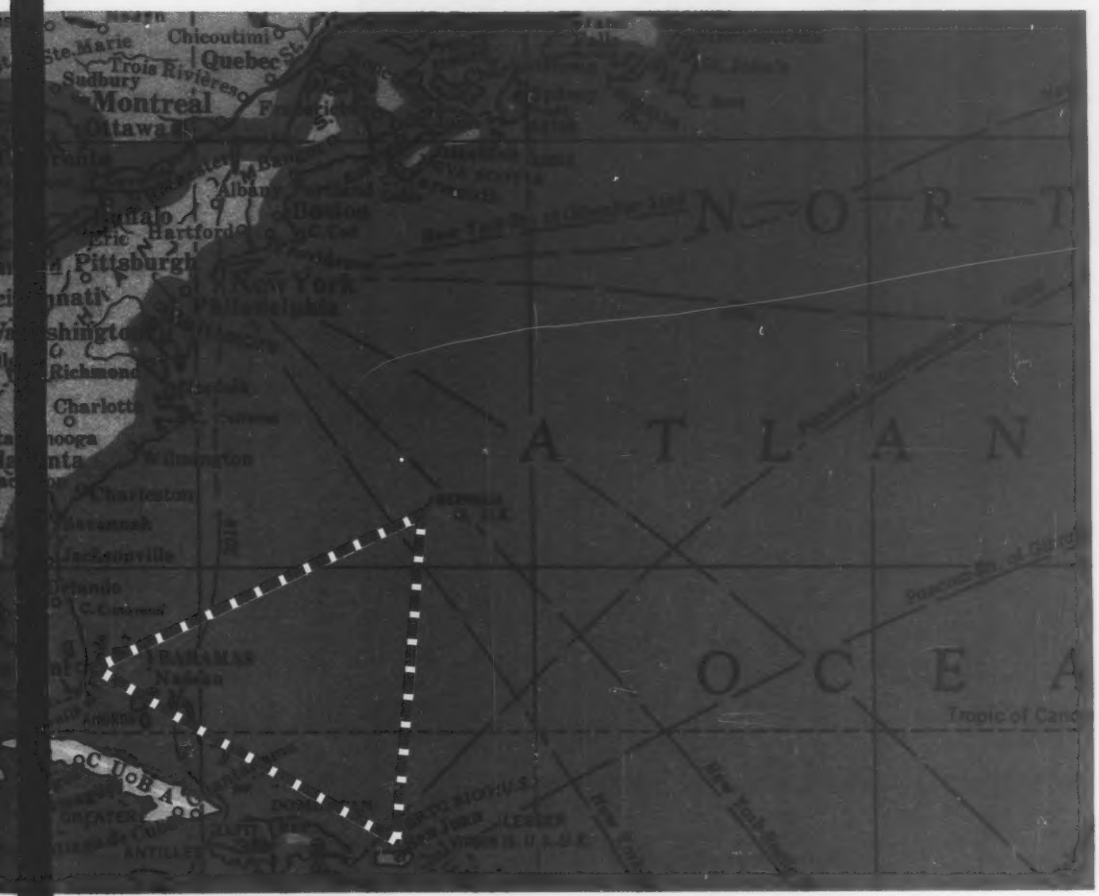
Open systems barrage

Wang earlier kicked off an ambitious open systems battle game plan with a battery of products, including support for IBM's 3270 and Advanced Program-to-Program Communications protocols, which permit IBM mainframe resources and applications to access Wang VS products (see story page 78).

Future IBM connectivity products will include full compliance with IBM's communications support for the System/36 and 38 mid-range computers and IBM and Microsoft Corp.'s OS/2 desktop platforms, as well as support for IBM's PU2.1 low-entry network multivendor, peer-to-peer communications under VS Access, according to Demko.

Coupled with IBM Token-Ring support, PU2.1 will enable Wang to deliver communications capabilities that will be competitive with IBM products such as the Application System/400, Wang claimed.

Of course, Wang will also continue to develop non-SAA products in response to market demand. Specifically, Demko cited SNA products for Unix systems, IBM Professional Office System gateways and additional bisynchronous network support.



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DEC, Allen-Bradley to mix blue-, white-collars

BY PATRICIA KEEFE
CW STAFF

NEW YORK — Digital Equipment Corp. and Allen-Bradley Co. hope to orchestrate a real-time marriage between factory-floor systems and business computers.

Last week, the two unveiled a strategic alliance, claiming it sets a precedent for multivendor integration of industrial control and information management environments. It is also the first time that DEC has licensed the integration of any VAX processor for a jointly developed product for commercial use.

Working with DEC, Allen-Bradley has developed the Pyramid Integrator, a turnkey modular system that reportedly eliminates the need to use a variety of interfaces and customized software to facilitate information sharing between business and factory-floor systems.

The pact was applauded by Advanced Manufacturing Research, Inc. (AMR) in Salem, Mass., a market research firm specializing in industrial automation.

In a recently conducted survey of users and vendors, AMR queried respondents about the role of the cell controller as an integrator between real-time device-level operations and plant information systems. One trend identified was DEC's position as the strongest general-purpose computer vendor in the factory. Allen-Bradley dominated in real-time controls applications.

"What users really want is to bring together the relative strengths of both" vendor's products, AMR said, adding that the challenge is for controls and computer vendors to more comfortably coexist, not compete, at the cell level.

VAX, Decnet support

The product family includes the PLC-5/250 Programmable Controller, the CVIM configurable vision module and a DEC Microvax Information Processor module. Also incorporated in the Pyramid architecture are DEC's VAX/VMS architecture and Decnet/Open Systems Interconnect networking.

The joint project also includes ongoing development, marketing and services. The vendors plan initially to target large automation projects.

The Pyramid Integrator reportedly will be available in the second quarter of 1989. Pricing information will be available in January, Allen-Bradley said. It will be sold through Allen-Bradley channels.

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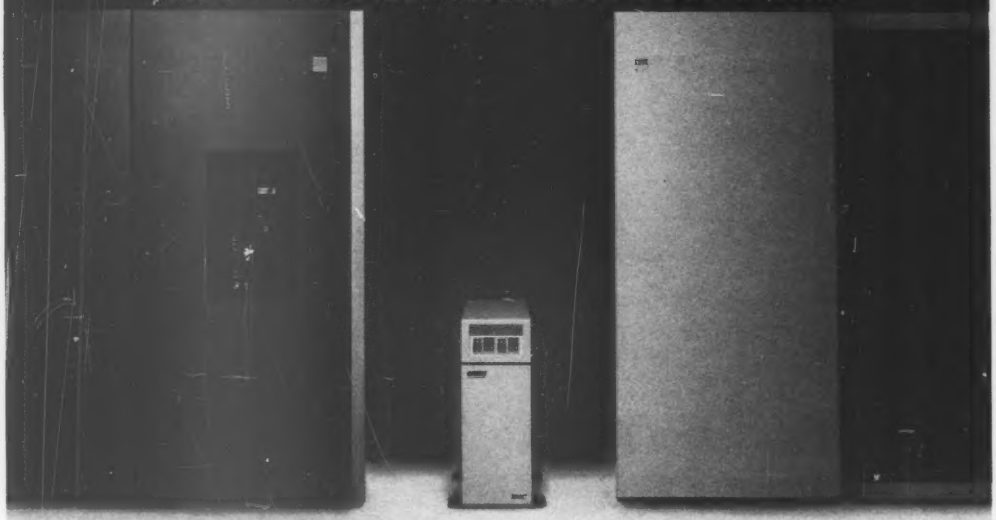

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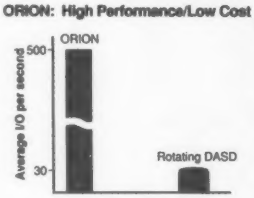

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Airlines get options free from Amdahl

SUNNYVALE, Calif. — Trying to get a foot in the airline reservation door and offering storage flexibility in its multiple domain feature as well as a remote monitoring device, Amdahl Corp. is giving away three new options.

For the airline market, it recently announced support for IBM's TPF software. With the option, Amdahl computers will be more suited to this niche, a company spokesman said.

Adding to the flexibility of its Multiple Domain Facility, which allows a CPU to be divided to perform different tasks, Amdahl announced a dynamic storage-reconfiguration capability to let users move storage capacity to the domain in which it is most needed.

Third, an Unattended Operations Facility allows remote supervision of the computer room and automatic response to routine events, the company claimed.

The enhancements are set for this spring on Amdahl's 5890 and 5990 mainframes.

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Retailers may soon be sold on expert systems

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Now that electronic data interchange (EDI) and bar-code technology are becoming commonplace, the retail industry is starting to explore artificial intelligence for its next wave of strategic information systems.

"AI is in the same place that EDI was three to four years ago," said Rachel Graham, vice-president of MIS at Macy's California, Inc., at last week's Retail Information Systems Conference. The annual show is sponsored by the National Retail Merchants Association.

There is some resistance from MIS managers who say they feel it is premature to get involved in AI, but Robert M. Zimmerman, director of retail consulting at Coopers & Lybrand in New York, said, "Expert systems are the obvious next step in retail information systems."

The goals are to help store managers and merchandise buyers make business decisions using the tremendous volume of data pumped out by MIS departments and to spread expertise throughout the chain of hundreds of stores, conference speakers said.

Most retailers are in the exploratory phase. "We're interested in exploring a pilot program involving expert systems, but we don't have anything going now," said Richard Skinner, systems and programming manager at J. C. Penney Co. in Dallas.

But speakers at the conference indicated that some AI projects are under way.

Computer cookies

Mrs. Fields, Inc., a 600-store specialty food retailer based in Park City, Utah, developed three expert systems — a labor scheduler, a job-applicant interviewer and a production planner — that have proven successful. The company is now trying to sell the software to other retailers.

Mervyn's, a Hayward, Calif.-based department store chain and subsidiary of Dayton Hudson Corp., developed two decision-support systems that use the Intellect natural-language interface from AICorp, Inc. in Waltham, Mass.

Several major retailers have begun pilot projects using expert systems, but they refuse to talk about them publicly because the systems are aimed at gaining competitive advantage, according to Joseph B. Elad, chairman of Retail Mate Corp., a software development and consulting firm in Wilmington, Del.

Elad and other experts said the most promising application for expert systems is in the field of merchandising, the process of getting the right merchandise in the right place at the right time at the right price.

Retailers are much more interested in expert systems than they were at last year's conference, Elad said. "Now they listen. Before they would just grin, thinking we were from Mars," he said.

"Retailers are generally cautious about adopting computer technology . . . because they see it as a cost rather than a benefit," said Max Dobres, retail industry manager for Digital Equipment Corp. in Merrimack, N.H. But he says he expects the more aggressive retailers will develop expert systems to help with the hundreds of decisions involved in "micro-marketing," that is, marketing products to narrowly targeted consumers and locations.

The things they'll do

Expert systems could perform the following roles in U.S. retail operations of the future:

- **Expert sales assistant:** Engages in on-screen dialogue with the customer, recommending the best selections for particular customer requirements.
- **Inventory replenishment:** Monitors store inventories and sales forecasts and uses expert rules to order just enough inventory to maintain satisfactory service.
- **Employee scheduling:** Develops employee work schedules that can be very complicated at large stores and in peak seasons.
- **Merchandise planning and distribution:** Plans the merchandise mix for each store as well as deciding how to distribute it.
- **Buyer's workstation:** Helps merchandise buyers to select the vendors with the best price breaks and shipping terms. Also monitors the purchase orders, invoices and shipping documents.
- **Cash flow management:** Gives small retailers the management expertise that only the larger chains can currently afford.
- **Store site selection:** Provides screening of new store sites, using demographic data and expert advice.
- **Planning floor space:** Plans or modifies floor space allocation to improve store image, profitability and customer traffic flow.

SOURCE: RETAIL MATE CORP.

Airlines plan to combine ticket systems

KANSAS CITY, Mo. — Two Canadian airlines plan to join Trans World Airlines and the parent company of Northwest Airlines as owners of the PARS computer reservation system, the airlines announced.

Air Canada and PWA Corp., owner of Canadian Airlines International, are to merge their reservation system — the Toronto-based Gemini Group Automated Distribution Systems, Inc. — with PARS, which is owned by TWA and Northwest's parent, NWA, Inc., and is the fourth-largest of five U.S. reservation systems.

The agreement in principle announced by the companies is subject to a completion of a formal pact and approval by boards of directors and Canadian regulators. It would add 3,500 Gemini travel agency locations to the 6,300 PARS sites, PARS said.

Efrain Zabala, president of PARS Travel, the system's marketing arm, said travel agencies using PARS or Gemini should have access to both systems by the second quarter of next year. Canadian travel agencies are to move to a fully integrated system between the fourth quarters of 1989 and 1990, he said.

PARS also said it is supplying software for the Abacus reservation system, owned by Singapore Airlines, Thai International and Cathay Pacific Airways, and is negotiating the inclusion of those airlines as partners.

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Bull, users meet face-to-face

BY J. A. SAVAGE
CW STAFF

PHOENIX — Wanting to believe that Honeywell Bull, Inc. is the new, strong and global company its marketing department presents, Honeywell Bull users came from around the globe last week and swamped the first unified users' meeting since the company's sea change.

Tossing out straws as well as handles for the users to grasp, new President Roland Pampel blessed the meeting with some of the hottest technology buzzwords as well as a reassurance to users that the company will not abandon its long-standing GCOS operating system. Addressing a combined meeting of HLSUA, Inc., a large systems users group, and the North American Honeywell Users Group, Pampel noted the firm's new directions:

- Interest in acquiring another company.
- A unification of Unix and the GCOS operating systems in one product with coprocessors.
- Support of IBM's Systems Network Architecture (SNA).
- Interest in reduced instruction set computing (RISC) architecture.

Company presentations assured users that the firm's focus, at least in the short term, will be on existing customers. But migration to the latest version of GCOS and its relational database package, Infoedge, is the price users will pay. In the future, Honeywell Bull will support only Fortran-77 ESV, C and Cobol 85 languages, product marketing manager Marilyn Guhr said.

Waiting, waiting

Users had waited for Honeywell Bull to reorganize before determining whether they would be abandoned and have to get rid of their systems, according to Charlie Kropac, director at large of HLSUA. Membership in the group has declined to a certain degree recently "because Honeywell Bull hasn't been selling," HLSUA President Dan Gratkowski said.

"The critical issue has to be the care and feeding of the installed base," said Don Bellomy, an analyst at International Data Corp. in Framingham, Mass. Bellomy added that dealing with its base is also the company's drawback "because it locks you into a low-growth situation."

In March 1987, Honeywell Bull — due for an imminent name change — emerged in its current state. It is owned 42.5% by Honeywell, Inc., 42.5% by Groupe Bull and 15% by the Japan-based NEC Corp. Groupe Bull will own a majority interest, with NEC's ownership unchanged by the end of the year.

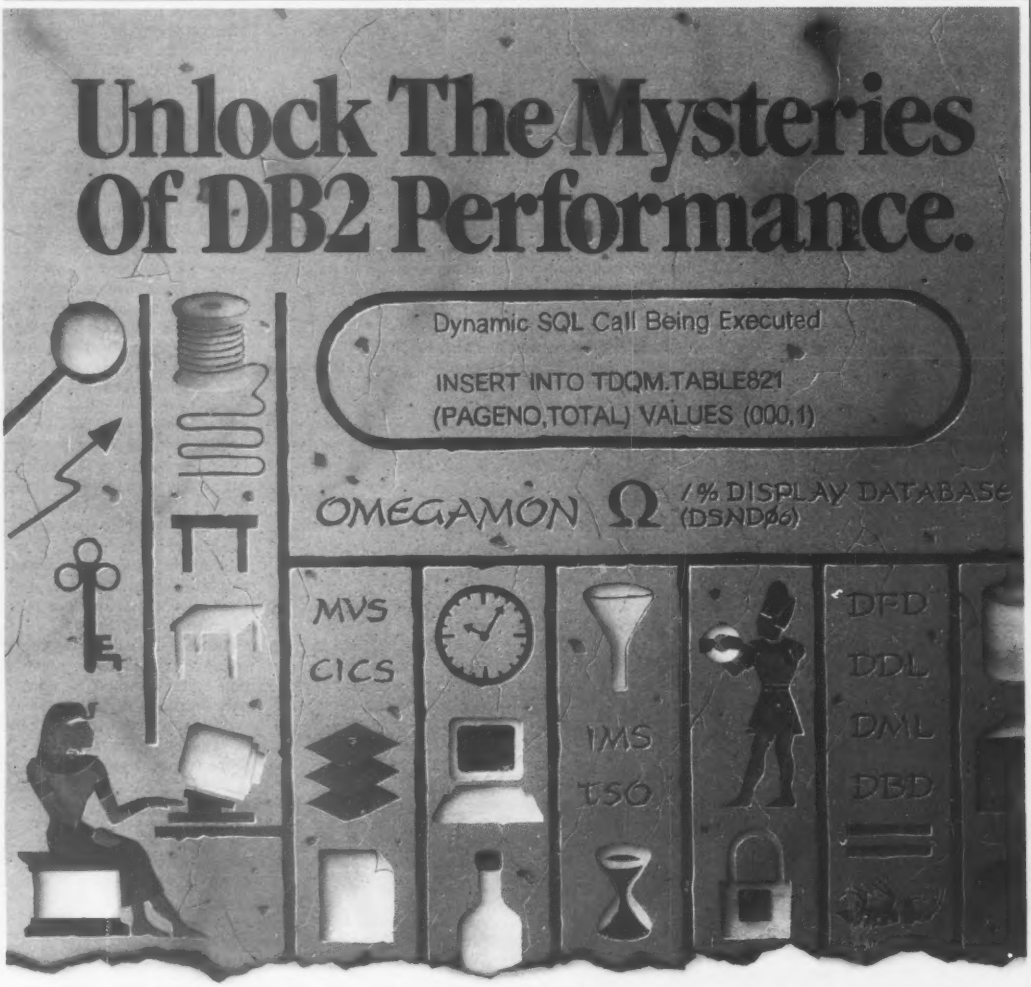
The company's share of the market has declined steadily since the early 1980s, Bellomy said. In 1982, it had about 17% of the market; that has declined to less than 7% worldwide, with 890 large systems in the U.S.

Despite the figures, the new company is bullish. Pampel said his $5 billion company is hungry: "If I told you the size of the company we were looking at acquiring, it would surprise you." He added that while that particular deal fell through, Honeywell Bull is still cruising.

In an effort to modernize, Honeywell Bull is moving toward a nonproprietary future, according to John Butler, executive vice-president for U.S. marketing. Unix looms large in that plan, with Honeywell Bull Italia, based in Milan, Italy, developing a hardware platform and London-based Honeywell Bull Ltd. developing software.

The Unix systems will have offers spanning the area between low-end mainframes and minicomputers with dual processors, one running Unix and one running GCOS, according to the company. It will keep GCOS, Butler said, because "as good as standards are, you have to give up something" in their implementation.

Details and time lines for the availability of SNA support and RISC products were unavailable.



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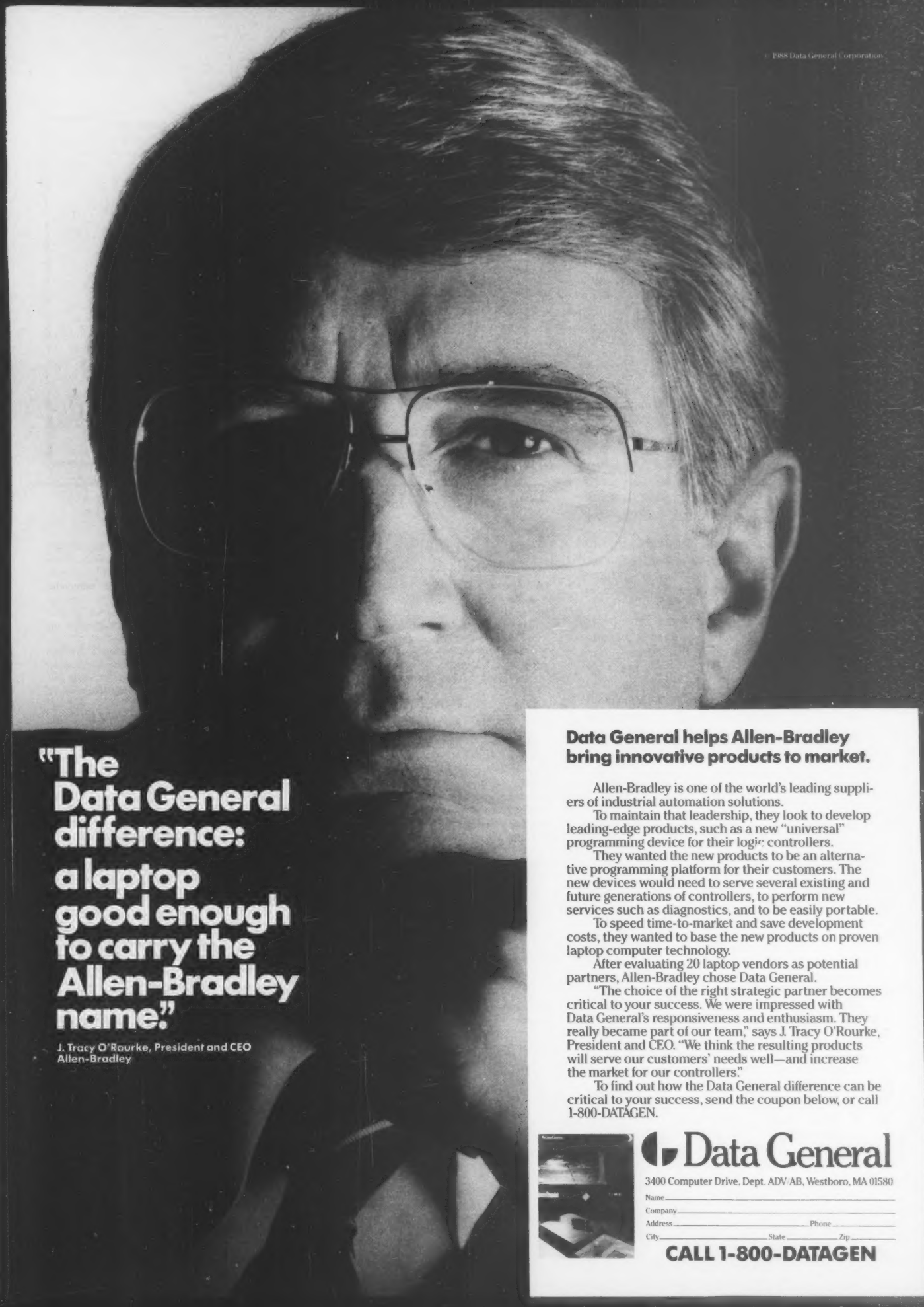

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EDITORIAL

To save the day

Look — up in the sky! It's a VAR. It's an OEM.

It's a systems integrator!

And as the hero and rescuer of so many federal, state and local government data processing projects starts to eyeball the potentially lucrative commercial accounts, questions from information systems management about systems integrators surface. What can they do for me? What can they do *to* me?

This week's Executive Report, which begins on page 93, highlights the complex issues that are surfacing as private-sector information managers grapple with the systems integration phenomenon.

There is no question that the number and volume of projects and entire system installations handled by systems integrators — independent contractors hired to weave and at times maintain seamless system tapestries — will grow rapidly during the next five years.

There are many reasons for this growth, with the greatest technology spur being the movement away from closed, proprietary architectures toward open systems characterized by greater standardization.

But if you want to know the real reason why systems integrators will become such a prominent part of the commercial IS landscape, consider this. The Index Group, a Cambridge, Mass.-based consultancy, recently compiled data on major in-house development projects undertaken by large U.S. firms. Of the projects undertaken, less than 1% were finished on time and within budget. On average, they came in a year late and at twice the estimated cost.

Small wonder that systems integrators, often offering fixed-price contracts for system development and installation, are gathering such appeal and acclaim despite the fact that these contracts don't come cheap at all.

The problem is that, in many cases, the impetus for seeking out and hiring a systems integrator is originating with upper management, not within the IS department.

It is perfectly reasonable for information managers to be suspect and even fearful of systems integration. No matter what kind of job the systems integrator leaves behind, the local manager is going to be responsible for it. Thus, hiring an integrator means giving up a measure of control over key points of development.

Furthermore, there are scary implications for in-house staffing if integrators prove to be the panacea many feel they can be. Cutting in-house staff and farming out an increasing share of the work load is very much in sync with the broader trend of replacing permanent workers with contract labor, reducing fixed costs.

Concerns notwithstanding, IS management will have to reconcile its fears and seek to exploit systems integrators as just another tool to accomplish the key goal of the coming decade: facilitating the proliferation of information technology throughout the organization and doing so by the most cost-effective means.

LETTERS TO THE EDITOR

A world language

Regarding Amy Wohl's article, "Computers still silent partners in high-tech" [CW, Aug. 8], she states that HAL 9000 and its counterparts have tainted our view of computer-generated continuous speech and language processing. She mentions several national languages as obstacles.

I agree that the structures of those languages are complex. But has anyone experimented with Esperanto? The language has few rules (16, I believe), no exceptions and a consistant vocabulary. Anyone who can handle any programming language's syntax can learn Esperanto. I concede that the primary reason Esperanto is so "clean" is that, as of 1987, only eight million people worldwide speak it. It hasn't had time to be corrupted. But what better place to start?

Charlie Hauser
Jansen Dane Companies
Madison, Wis.

Back to basics

Your column by Dan Nolan, "Bad language" [CW, July 25], reiterated a common and increasingly visible problem: the lack of basic language skills among many professionals today. While this article focuses on the inability of programmers to interact effectively with a computer if they do not understand the basic elements of langauge, the problem is more pervasive. More problems occur because programmers can't communicate effectively with analysts and customers.

Communication is hard enough when all the parties are reasonably well versed in the basics of their language and its use. When one or more of the parties is lacking this understanding and knowledge, it is much harder to achieve an effective transfer of ideas, information and instructions.

The bottom line is that our schools need to bring back programs that teach the basics of the English language. Grammar, sentence construction, proper use of vocabulary and all the rest of the missing ingredients of good language and communication need to be learned early in life. Overcoming the inability to use the language properly to achieve an effective communication, whether with another person or a machine, is one of the most important issues facing our educational system today.

Regrettably, it will take years to turn around the programs until people begin to enter the work force who have a solid grounding in the language coupled with training in effective communications skills. Meanwhile, organizations of all types in this nation and the world are going to have to contend with this problem and make a significant effort to correct it.

David R. Fuller
Information Systems Manager
Calmark Hospitality Systems
San Diego

No hard sell

I read with great interest the article on Computer Associates International, Inc. [CW, Aug. 29]. While the feeling of security in dealing with a mega-company may exist, I, too, have found the sales force aggressive to the point of extreme arrogant annoyance.

After visits from several employees with this attitude, we now have a more customer-oriented salesperson who actually talks with us — not to us. Hopefully, this trend will continue. And while Charles Wang discounts "bigness" as a non-issue on growth, it is indeed an issue when applied to an arrogant and abusive sales force.

James T. Werther
Vice-President of Systems
Bombardier Credit, Inc.
Burlington, Vt.

Tough all over

I was struck again by the pomposity of computer programmers when I read "Living in two worlds: A programmer's lament" by Dan Woods [CW, July 18].

Does he think programming is the only field that uses technical jargon? My husband is a recording artist. Music is not what I would consider a technical field. But when he gets excited about a song that he has just mixed down from eight tracks to two, re-equalized, added digital reverb and delay to, compressed, limited and put in a noise-gate, what can I say but to look at him with glazed eyes and say, "It's a pretty song"?

His own mother is even worse. She will listen to his pretty three-minute song that he has worked on for a week, then announce, "It's nice, but when are you going to get a real job?"

Marsha J. Rogers
Programmer/Analyst
Indianapolis

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

Seeking secrets of SIS success

A strategic information system should reflect a company's decision process

WILLIAM WALTER

A full-blown, useful strategic information system (SIS) has yet to make an appearance on the open market. It will take an invention or considerable innovation to produce it, because the proper approach is not obvious.

Computerworld columnist Efrem Mallach has suggested that a successful SIS might be achieved by a process of "working backward to strategic systems" — not bad thinking.

However, this process would produce a flock of different system approaches. Each resulting SIS would be uniquely designed to satisfy the sponsoring company's needs, reflecting its own solution rather than a common or generally workable system.

The typical approach to designing any such system is to provide information to the decision maker in the organization according to his special responsibility — finance, accounting, engineering, marketing, sales.

The system is then intended to be used exclusively by that part of the organization.

Thus far, these computerized information systems tend to serve a useful purpose at the operating level of the organization, but they do little, if anything, toward serving the needs of middle and top management.

What is needed first and foremost in inventing a useful SIS is to design a suitable information system framework: a common, formal way to collect, distill, organize, process, control and disseminate whatever information a system contains, no matter how or why it's collected or where it comes from.

To achieve this first goal, the useful SIS should not be aimed at the decision maker, but rather should match the overall organization's decision process.

In its most general form, the decision process consists of four steps: evaluating the impact of change, including defining alternatives; deciding among alternatives; planning; and implementing, including result tracking — a closed-loop process. Operating within such a framework might be described as a "management by decision" process.

The key to determining what that framework should be is found in examining why an SIS is needed in the first place. Three issues come to mind: the acceleration of change; the information explosion; and the need for all levels of management of an organization to manage, rather than merely cope with issues.

Being able to do nothing more than cope with change and the information explosion means to be forever in a reactive mode, always at the mercy of the waves and tides of world events.

Getting on top of the situation means having the wherewithal to influence those winds and tides so that your competition does the reacting, not you.

Attempts have been made to develop a useful SIS by integrating or otherwise interrelating individual MIS packages in various combinations (sales, marketing, manufacturing, engineering, finance and so on) to serve the information needs of middle and top management decision makers. All have been found inadequate.

Other attempts at SIS include providing summaries of operating-level information to middle and top management. Those, too, have been found wanting.

The reason, partly, is that the information needs of top and middle management are in constant, accelerating change. The information a given decision maker needs at the moment may involve finance, sales and engineering; the next decision may require access to the latest available information about legal, tax and insurance matters.

Systems designed to serve the decision maker according to his organizational responsibility tend to be too restrictive — canned software packages in which the issues addressed are preset and inflexible.

That is precisely why the framework established for a useful SIS needs to be oriented to the decision process, irrespective of the structure of the organizational chart.

One example comes to mind in which the framework of an existing MIS meets these criteria for an SIS: manufacturing resource planning (MRP). Interestingly enough, the notion that MRP is organizationally oriented is so strongly embedded in people's minds that even those who should know better think that MRP is exclusively a manufacturing information system. There are many cases in which this misconception has led to an otherwise useful SIS system being abused and misapplied. A properly managed MRP system serves the information needs of all levels of management, marketing, production, engineering and finance alike.

TOM LULEVITCH

MRP defined

An MRP system is one in which the information system matches the manufacturing business decision process. The objective of MRP is to get the right material, in the right quantity, in the right place, at the right time. It was designed to provide top, middle and operating-level managers with the information they need to make the decisions that will achieve that objective routinely. The benefits of successful implementation of MRP are real; they include improved efficiency and profits.

A growing demand is emerging among nonmanufacturing organizations, in both the private and government sectors, for a workable SIS.

The Department of Defense, for example, is actively seeking a suitable SIS to assist in managing major weapon system development programs from the concept stage through operation.

MRP alone cannot satisfy such a requirement. But an SIS based on a management-by-decision process just might produce satisfactory results.

Walter is a program manager at Aerojet Solid Propulsion Co. in Sacramento, Calif.

EISA challenges IBM for desktop control

DALE KUTNICK

Controlling commercial users' desk tops is imperative for information systems providers because the desktop appliance provides the base-level user environment — the interface to local and remote applications, connectivity to networks and access to other computing and database resources.

PC hardware vendors are essentially slaves to de facto network and software standards. Significant desktop control is exerted by local-area networking companies like Novell and 3Com, by software companies like Microsoft, Ashton-Tate and Lotus and by software and networking companies like IBM and DEC.

> IT HAS BECOME painfully apparent that IBM no longer controls the desk top. While it still has the largest share of any single vendor (about 22%), the EISA group cumulatively controls more than 60%.

Nonetheless, personal computer hardware suppliers benefit not only from users' rapid growth to new systems but from add-on peripherals, memory and so on. Annual PC shipment growth is still topping 35%.

But on the downside, there is minimal user loyalty to PC hardware vendors, and add-on sales often go to third parties. Finally, profit margins for most PC hardware suppliers are tenuous at best.

Enter EISA

Still, the battle for desktop real estate rages. The Sept. 13 announcement of Extended Industry Standard Architecture (EISA) by a consortium of PC vendors — almost all ex-IBM PC cloners, led by Compaq, AST, Wyse, HP, Tandy, Olivetti and NCR — will only intensify this competitive environment.

EISA's open, 32-bit, intelligent I/O bus — based on an extended AT bus — standard will offer users backward compatibility with their AT boards and will challenge IBM's proprietary Micro Channel Architecture (MCA) Personal System/2 in both performance and functionality.

Moreover, EISA will have clout because it is a unified standard; its members will cumulatively ship more than 60% of the worldwide business PCs in 1988, vs. IBM's 22%.

Not only have most PC suppliers lined up behind EISA, but so have Intel and Microsoft. OS/2 compatibility will ensure a wide variety of application program availability when EISA systems are delivered.

EISA is not, however, a panacea for the PC vendors. EISA products will not be available for nearly a year — an advantage for IBM and Apple. Manufacturing overcapacity in the PC market will become an issue during the next two to six months, creating another price war.

In addition, an open EISA will bring a flood of Japanese and Asian imports, exacerbating the oversupply and the pricing pressure.

Finally, EISA members will be forced to differentiate their products outside the I/O bus — in architecture and implementation of memory management, multiprocessor buses, coprocessors and so on. This effort will require substantially higher research and development budgets, which only the top players can afford.

More important, IBM's MCA-based PS/2 has been isolated, and with it IBM's logical control of the desk top is being threatened, since EISA-based PCs will have no special affinity for the IBM Systems Application Architecture (SAA) environment.

IBM's strategic blunder

It once appeared that the IBM environment would dominate the desk top, as users moved to connect their PCs to each other (via Token-Rings) to seek higher levels of computing and to upgrade to more powerful systems.

Indeed, the PC's success had finally enabled IBM to circumvent the minicomputer vendors and to reach the end user with a popular solution.

But IBM PC-DOS-based PCs have no more affinity in terms of connectivity and interoperability for IBM's 370 and Application System/400 world than for other systems.

PC-DOS is simply not robust enough to participate fully in SAA and continue to maintain its ease of use and its autonomy.

Continued on page 22

Kutnick is a data processing and communications consultant based in Redding, Conn. He was formerly executive vice-president of research at the Gartner Group, Inc. and executive director of The Yankee Group.

Kutnick

FROM PAGE 21

OS/2 provides the first opportunity to really integrate SAA's broader capabilities, and the PS/2 was designed to take advantage of them.

But IBM took a short-term, tactical perspective — maximizing profits on the PS/2 — and tried to take control of the desktop hardware and software markets by imposing proprietary systems. It is charging prohibitively high licensing fees for the privilege of spending millions to unravel the PS/2's difficult (for cloning) technology, and IBM legal action is still a threat.

Given that broad SAA affinity was — or should have been —IBM's strategic imperative, it would have made far more sense to have had the PC market standardize on the PS/2 with IBM's OS/2 Extended Edition. PS/2s and clones would occupy far more desk tops than the IBM version alone. Only about 1.3 million MCA-based PS/2s have been shipped thus far, along with another 1.3 million non-MCA PS/2s.

A compound fracture

In fracturing the PC business, IBM has made a grievous strategic error. It has become painfully apparent that IBM no longer controls the desk top. While it still has the largest share of any single vendor (about 22%), the EISA group cumulatively controls more than 60%.

The EISA companies will not only gravitate away from MCA but will look to Microsoft for OS/2 standards and to Microsoft and Novell for LAN operating system leadership.

Even more damaging, they will likely look to DEC's VAX and Unix-based minicomputer and LAN server systems for higher level computing options, relying on these systems to provide SAA connectivity.

Thus, I expect that IBM's MCA-based PS/2 and its OS/2 Extended Edition will become primarily "niche" products in IBM-dominated accounts. There will be little incentive for other users to acquire these more expensive SAA-affinity systems. I also believe that IBM will adopt the EISA standard as its AT-bus replacement by late 1989 or early 1990.

The bottom line is this: IBM is the big loser in the long run, especially from a strategic perspective. Apple will be a winner because its vision remains clear and intact. Its Macintosh looks even stronger as an alternative to a confused PC environment, especially given OS/2's continued delays.

The strongest of the EISA members will be winners, albeit with lower margins. The Japanese and Asian PC vendors, which will quickly adopt EISA, will also be winners.

DEC could be a winner, because IBM's control of the desk top has been broken, and it could emerge as one of the primary EISA upward connectivity champions; server vendors and Unix suppliers have a similar opportunity.

Users will be the winners, because next-generation PCs will cost less and have backward AT compatibility. There will be more value-added differentiation among EISA suppliers. And there will be three stable platforms for software and board vendors: IBM's MCA-based PS/2, EISA machines and the Macintosh.

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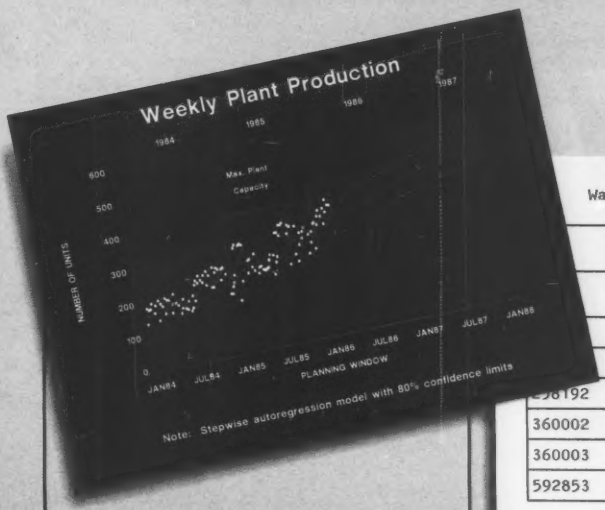

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	89450	5000	FRI, FEB 20, 87
298192	20110	1000	MON, MAR 30, 87
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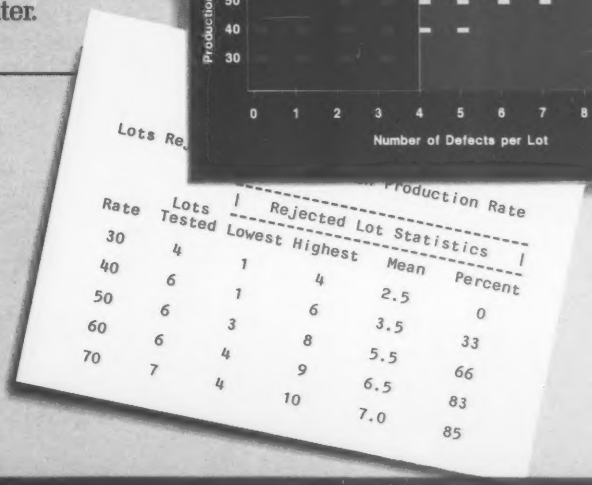

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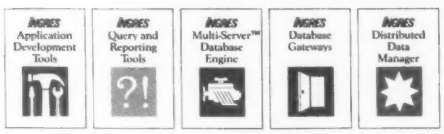

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HARD TALK

J. A. Savage

It's solid but not sexy

It wasn't a White House press conference, but damage control descended like executive aides after a presidential gaffe.

National Advanced Systems was in a snit. It didn't like what people were saying about its new mainframes so much that not only did the billion-dollar company send its lone public relations man on a post-announcement tour with analysts and press — in a kind of "what-the-president-meant-to-say-is-this" mode — but it tried to pin the bad press coverage on misquotes.

The company's new line of mainframes — actually a unification of its two earlier lines — plus a little added processor capacity at the high end, had not been wildly received. Enthusiasm for the Sept. 13 announcement was further eroded by skepticism over NAS' poor financial situation — few or no orders were taken for mainframes this summer.

It's not that NAS has bad products. NAS, and its Japanese supplier, Hitachi Ltd., have a good reputation for reliable systems — particularly in storage

Continued on page 35

IBM shadowboxing?

Study predicts that the AS/400 will oust the 9370

BY ROSEMARY HAMILTON
CW STAFF

Just when it looked like the IBM 9370 would become a moderate success, a report has surfaced to stir things up again. This time, the claim is that the IBM mid-range Application System/400 will snatch away what could have been future 9370 sales.

The Sierra Group, Inc. in Tempe, Ariz., recently completed a survey of MIS executives and concluded that the bulk of them prefer the AS/400 over the 9370. Several of the executives surveyed in IBM 370 shops said they would halt future purchases of 9370s in favor of the other IBM mid-range offerings.

However, *Computerworld*'s random interviews with a handful of 9370 sites last week showed that roles as a specialized system in a 370 environment or as a host in small companies can still be claimed by the 9370.

MIS executives contacted by *Computerworld* last week, independent of The Sierra Group, said they would not abandon their 9370s for the follow-on to the System/36 and 38 platforms.

The Sierra Group's research was based on interviews with members of its MIS Executive Council, which it said is made up of top U.S. companies that it chooses not to identify. The recent survey was based on discussions with 62 council members, while 32 specific responses were included for the actual report. Of that group, "most" expressed a preference for the AS/400.

"The point is [the report] is less an endorsement of the AS/400 and more of a rejection of the 9370," said Marty Gruhn, vice-president of The Sierra Group.

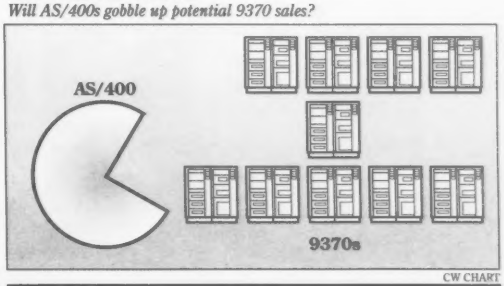
According to Gruhn, the report may also reflect reaction to the AS/400's highly publicized rollout. "It could also be a product of the perception that the AS/400 is the latest and greatest, and the 9370 is a loser," Gruhn added.

Nonetheless, The Sierra Group released a summary report that included comments from 21 respondents. Of that group, 10 said they thought the AS/400 was more appropriate for their needs than the 9370. Within that group, a few said

Continued on page 34

The Pacman effect

Will AS/400s gobble up potential 9370 sales?

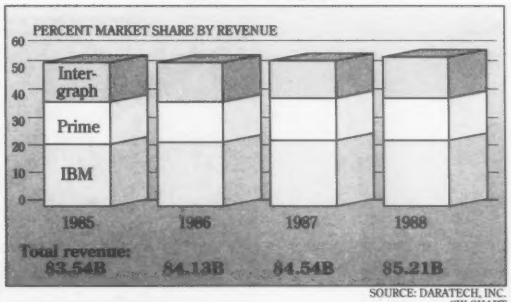


CW CHART

Data View

CAD/CAM/CAE top players

Among the three major vendors, Prime has slipped slightly and now is on a par with Intergraph



SOURCE: DARATECH, INC.
CW CHART

Tape negotiations stall

BASF offers Sun Exploration new tapes, not cash

BY ROSEMARY HAMILTON
CW STAFF

BASF Corp. and the Sun Exploration & Production Co., locked in a six-month dispute, sat down at the bargaining table but failed to reach a compromise last week.

For several months, the Dallas-based Sun Exploration has been demanding replacement of 32,000 IBM 3480-compatible tape cartridges because it claims they are defective products [CW, Sept. 26]. Sun Exploration also requested $571,000 as financial reimbursement for the time it has already spent on its tape

Continued on page 31

Inside

- X/Open consortium welcomes Bonin. Page 29.
- Smith Kline turns up nose at newer technology, opts for more powerful Vaxcluster. Page 29.
- Britz Publishing unleashes software tool. Page 43.

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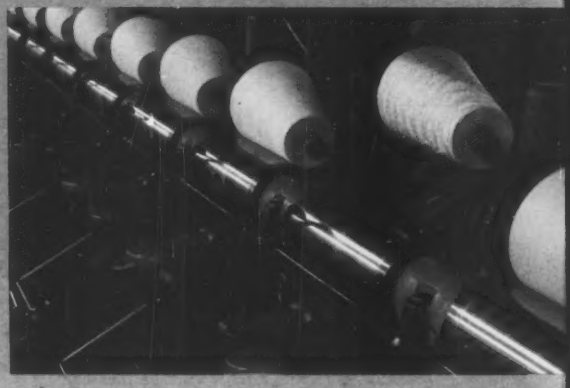

To maintain its #1 position in the synthetic fibers industry, DuPont Fibers, the largest department in DuPont, undertook the most sweeping integration of manufacturing facilities in the company's history. According to Andrew Harriss, Manager, Information Systems, "Our goal was to improve manufacturing efficiency and customer satisfaction. We selected Digital's VAX architecture and Ethernet communications to help us automate our manufacturing processes and make the leap from centralized computers to distributed systems. Digital's architecture – in computer systems, software, and networking – was key to our choice. It's easy to use, highly flexible, distrib-

"The single architecture that ties DuPont Fibers' manufacturing together and vastly increases our efficiency."

uted and expandable. And it delivers the goods...far better than what we'd been used to."

Harriss further states, "The VAX and Ethernet solution has been a godsend. Teamwork and information sharing are vastly improved. We're able to respond much more quickly to our customers' needs. We can now change the way we do things, not just do the same things better. Competitively speaking, we're very well positioned for the future."

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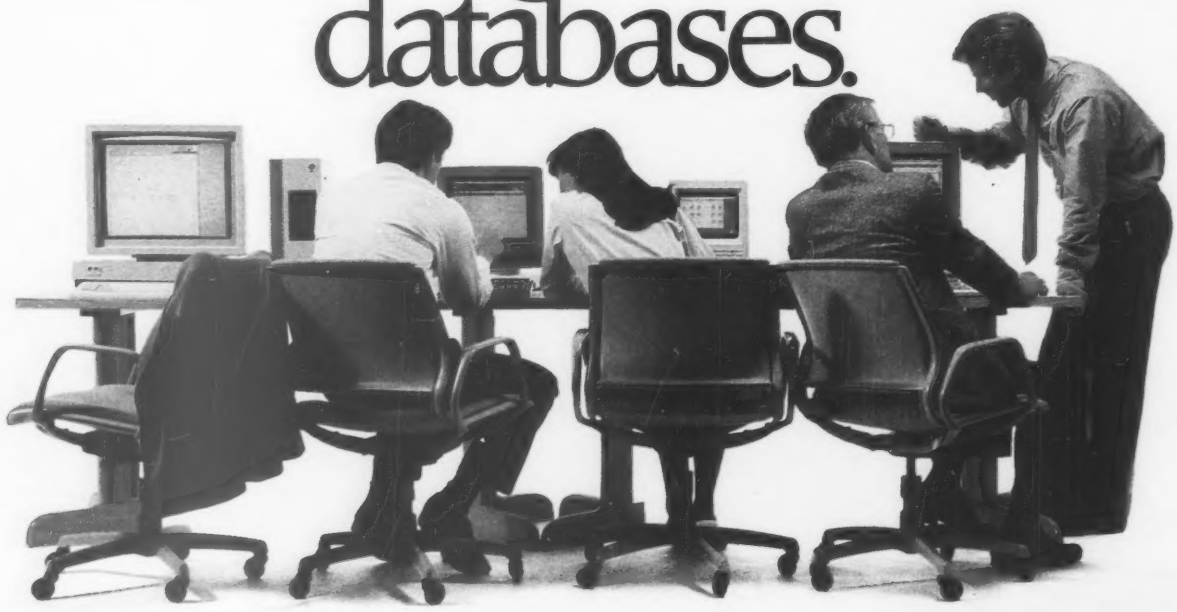

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SOFT TALK

John Bruce

Ready for security?

Some of the biggest vendors — IBM, DEC and Computer Associates — have announced their intention to produce access control and operating system software that conforms to the National Security Agency's (NSA) B2 classification for system integrity.

The B2 classification mandates rigid segregation of system files and processes according to security levels and categories.

But the specific requirements are of less interest than the impact that conformance to B2 standards may have on the computer industry in general.

While some of the vendors' announcements cover software that is currently under evaluation by the NSA, no version of Xenix, DEC's VMS, IBM's MVS, VM, RACF, CA's CA-ACF2 or CA-Top Secret is actually rated B2 as of this writing. In fact, most product plans are still in the statement-of-direction phase, with actual certification years away.

Nevertheless, some defense contractors have begun to experiment with modified access control and operating system software that comes close to emulating a B2 environment.

The results, briefly put, are that most proprietary software products — and even some basic system functions like job scheduling or disk-space management — will not run on a system that conforms to B2 re-

Continued on page 36

Sharpening X/Open

New chief Bonin emphasizes environment

IN PERSON

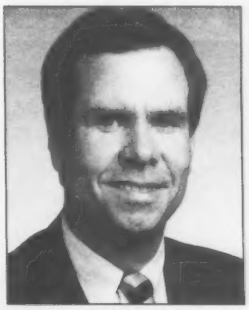
William Bonin was recently appointed vice-president of North American operations at the X/Open Consortium, Ltd., the international consortium of computer vendors working toward developing a common application environment.

Previously, Bonin set up and managed X/Open's Independent Systems Vendors relations program. He is now responsible for X/Open's North America work, including its technical program, public relations, and coordination of government relations for X/Open and its North American members. *Computerworld* Senior Writer Amy Cortese recently spoke with Bonin.

What are X/Open's goals for the next year, and what will your role be in achieving them?

We're focusing next year on trying to make sure that the CAE [the X/Open Common Applications Environment] is used in procurement. In the past, our goal has been to establish market awareness, and we think that we've been pretty successful at that.

Continued on page 35



Bonin *on X/Open goals*

Opting for an 8978 Vaxcluster power boost

ON SITE

BY JAMES DALY
CW STAFF

KING OF PRUSSIA, Pa. — Earlier this year, when Smith Kline & French Laboratories, a division of the Smith Kline Beckman Corp., was looking for more power than its Digital Equipment Corp. Vaxcluster was giving it, DEC was getting ready to roll out a high-end symmetrical multiprocessing system.

But the pharmaceuticals laboratory stayed away from the newer technology and opted for a more powerful Vaxcluster instead.

Six months later, officials at Smith Kline said they are pleased with their choice. The 8978 Vaxcluster gave them the power boost they needed immediately without disrupting their environment. The symmetrical multiprocessing systems would have taken much longer to become fully functional in their environment, Smith Kline officials said.

"There would have been at least a one-year void," said Ronald Lego, director of worldwide shared systems at the laboratory.

Not only would the Smith Kline staff need time to adjust, but they would also have to wait for third-party software vendors to modify their software to the DEC VMS Release 5 operating system, which is required in the symmetrical multiprocessing environment.

These days, the VAX 8978 cluster gets a "10" in terms of performance, Lego said. The cluster is based on eight 8810s, which are the single-processor versions of the 8800 series. Higher end models of the 8800 series offer the symmetrical multiprocessing.

"The system has been performing about as close to flawlessly as we could expect," Lego said.

Since converting to the new cluster in April, Lego's group has observed a greatly improved response time, Lego said.

His staff uses a test application, developed in-house, to measure response time. Any re-

Continued on page 36

SOFTWARE NOTES

Alis calls on Oracle

Oracle Corp. in Belmont, Calif., recently announced an interface with Alis, an office automation package produced by **Applix, Inc.** in Westboro, Mass. They also said they will jointly market their products.

The Oracle interface to Alis will allow users to run Oracle database queries using SQL from within the Alis environment. Alis users will be able to bring data from Oracle into any application, including multifont text-processing, spreadsheets, business graphics and electronic mail.

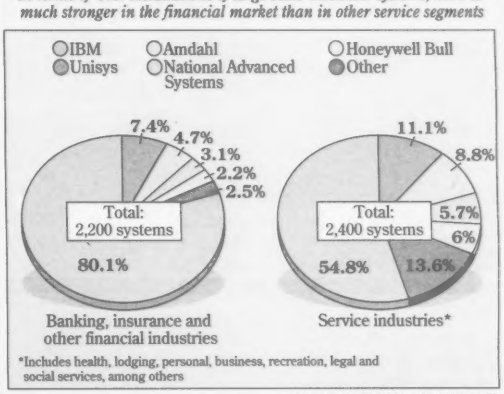
Boole & Babbage, Inc. announced recently that its full line of performance management tools is compatible with the IBM Enterprise Systems Architec-

Continued on page 34

Data View

Big Blue big in banks

In terms of U.S. installations of large-scale multiuser systems, IBM is much stronger in the financial market than in other service segments



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HARD BITS

Hey, we service 3090s too

Perhaps there is more to the IBM 3090 service market than meets the eye. When Terrence Rollo, vice-president of marketing and sales at **DPCE, Inc.** in Norristown, Pa., read a *Computerworld* article saying that Control Data Corp. is launching a maintenance service for 3090 mainframes, he felt left out. Rollo said his company services 3090s as well. At the moment, DPCE has only one client, Cessna Aircraft Co. in Wichita, Kan. But Rollo claimed DPCE is negotiating with several others and should have a revised customer list shortly.

Mitsubishi Electric Corp. said it began sample shipments of a semiconductor laser for optical disk drives. The ML5XX5 laser is suited for the write/read light source of optical disk drives, the company said. It is priced at $160.

Intelligent Information Systems, Inc. said it signed a distribution deal with **Dana Marketing, Inc.** in Torrance, Calif., for its peripherals and communications devices that work with the IBM System/36 and 38 and Application System/400 mid-range systems. Dana will purchase as much as $3 million worth of the company's display workstations, communications controllers and printers.

Calcomp, Inc., a division of Lockheed Corp., said it cut the price of its 1043GT pen plotter from $8,905 to $7,995.

Dotronix, Inc. said it received $16 million in new orders for its CRT displays and video monitors. According to the company, half of the orders came from investment and banking institutions, while the remaining $8 million in orders came from a manufacturer of medical diagnostic equipment.

Alliant Computer Systems Corp. signed a joint development and marketing agreement with **Ultra Network Technologies, Inc.** that will allow Alliant mini-supercomputers to communicate on a network with 1G byte/sec. speed. The companies will work to integrate Ultra Network's Ultranet interface with Alliant's high-speed port.

The customer service division of **TRW Information Systems Group** said it is cutting prices on service agreements for Altos Computer Systems' mainframes and peripherals. The cuts average 30% and become effective starting this week.

Quarter-Inch Cartridge Drive Standards, Inc., an industry association based in Santa Barbara, Calif., reported recently that at least two companies have started shipping sample 1.3G-byte tape cartridges for evaluation and testing purposes. The association said the goal is to have 1.3G-byte products on the market by 1990. The two companies are 3M Co. in St. Paul, Minn. and DEI/Carlisle in San Diego.

Prime Computer, Inc. said it struck another deal with SAS Institute, Inc. With the agreement, the two will jointly market each other's products. In 1985, Prime teamed up with SAS in an agreement that called for the sharing of technology. The pair will focus on the government and education markets, Prime said.

Sequoia Systems, Inc. in Marlboro, Mass., said its Series 200 has been selected for use in the Federal Aviation Administration's Weather Communications Processor systems. Sequoia was actually selected by the Government Networks division of Contel ASC, which is the prime contractor to the FAA for this weather system. The FAA will use 24 Sequoia systems, the company said. The contract value has been estimated at $11 million.

Tape negotiations

CONTINUED FROM PAGE 25

problem, as well as for the time it expected to spend in the future resolving the matter.

BASF, until late last month, had maintained that it would not respond to either request until Sun Exploration provided system performance reports showing BASF tapes were the source of any problems Sun Exploration may have encountered.

Last week, James Myers, Sun Exploration's manager of hardware and data storage, provided *Computerworld* with a letter from BASF in which the tape supplier said it would replace the tapes in an effort to resolve the dispute.

In the letter, BASF held its position that Sun had never shown proof that the BASF product was defective.

Myers said the offer is a positive step by BASF but that Sun will hold out until the tape supplier also offers the requested financial reimbursement. Myers said Sun would be willing to back off the $571,000 amount and negotiate a new sum.

John Healion, director of marketing at BASF, said the company will "absolutely not" provide Sun with any money on top of the replacement tapes.

Healion said the offer to replace the tapes in no way implies that BASF's products were defective. He would not say how much the replacement tapes would cost BASF.

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VM Teleprocessing	*10/25/88* Chicago
VM/CMS Workshop	*10/31/88* Columbia (MD) *11/28/88* Chicago
Assembler Workshop	*10/31/88* Houston
VSAM Workshop	*11/28/88* Houston
CMS Structure & Flow	*11/1/88* Columbia (MD)
SMP/E Maintenance Workshop	*11/7/88* Chicago *11/14/88* Orange (CA)
DB2 System Fundamentals	*11/7/88* Columbia (MD)
MVS ICF Catalogs	*11/14/88* Boston
VM System Fundamentals Workshop	*11/14/88* Chicago
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Shadowboxing?

CONTINUED FROM PAGE 25

they would stop buying more 9370s and go with the AS/400 instead.

But in 9370 customer sites contacted by *Computerworld*, this opinion does not hold. At F. W. Woolworth Co. in Milwaukee, Wis., MIS Director Victor Bruenig runs a 9370 at a remote site strictly to drive an IBM 3800 printer. "I wouldn't make a 9370 vs. an AS/400-type decision," Bruenig said.

Bruenig said AS/400s might be installed in the future as replacements for System/36s in remote sites serving an office automation function. "Out in the field, it would be a logical progression to move to an AS/400. But we wouldn't have been looking at 9370s for office automation anyway. That's overkill, putting a mainframe in an office."

Similarly, the aerospace division of General Electric Co. in Philadelphia is using several 9370s to drive printers at remote locations. According to Howard Kerr, manager of the division's Valley Forge Computer Center, it would not make sense to replace 9370s in this capacity with AS/400s, because the printer function is controlled by the 3090 host.

Another 9370 user has set up the low-end mainframe as the manager of its distribution center. The Jamesway Corp. in Secaucus, N.J., said it plans to offload applications that have been running on an IBM 4381 to the newer 9370 at the firm's distribution center.

"We wanted something that would eventually grow into a mainframe," said Richard Prince, DP director at Jamesway. "Also, we run lean and mean when it comes to system development. Nobody here is an RPG programmer."

According to Jeffry Beeler, an industry analyst at Dataquest, Inc., the switch from 9370s to AS/400s will happen in small numbers because of the migration effort involved. "I don't think we'll see it in large numbers," Beeler said. "The AS/400 will sell to small businesses or to divisions of large companies that aren't 370-oriented."

> "OUT IN THE field, it would be a logical progression to move to an AS/400. But we wouldn't have been looking at 9370s for office automation. That's overkill, putting a mainframe in an office."
>
> VICTOR BRUENIG
> F. W. WOOLWORTH

Notes

CONTINUED FROM PAGE 29

ture/370 environment as well as the IBM Processor/Resource/System Manager (PR/SM). PR/SM allows for a single processor's resources to be shared among multiple operating systems.

Software 2000, Inc., a supplier to the IBM System/38 market, has signed an agreement with **Arthur Andersen & Co.** to market Software 2000 financial and human resource applications with Arthur Andersen's manufacturing and distribution applications.

TLM, Inc. in Port Chester, N.Y., is publishing five $20 to $30 books on IBM's DB2 and SQL by Boris Musteata and Robert Lesser, who previously authored books on VSAM and CICS. The volumes include *The DB2 Guide: Developing DB2 Applications and SQL Programming* and *Relational Data Base Design for DB2 Applications.*

Alliant Computer Systems Corp. competitor **Convex Computer Corp.** said its Ada compiler has been certified by the Ada Joint Program Office.

VMark Software, Inc. has made Universe, its application development environment product, available on Interactive Systems Co.'s 386/IX, an implementation of Unix for the Intel Corp. 80386 platform. VMark's Universe enables applications written for either Pick Systems, Inc.'s Pick or the Prime Computer, Inc. Information environment to run on a variety of Unix-based systems.

Stellar Computer, Inc. in Newton, Mass., recently signed agreements with five application software developers: Intelligent Light, Inc., Wavefront Technologies, Media Logic, Inc., Paragon Imaging and the University of Lowell. Stellar now claims 40 application packages for its GS1000 graphics supercomputer, introduced in March.

Neuron Data in Palo Alto, Calif., and **Teknowledge, Inc.** recently announced an agreement under which Teknowledge will provide application development services and training courses for Nexpert Object, Neuron Data's leading expert system shell.

Nexpert Object is an expert system software shell for developing industrial and commercial applications. It runs on a variety of workstations.

Everybody talks OLTP.

Tandem does it.

JUMP

CONTINUED FROM PAGE 29

Bob Ackerman recently left as X/Open's chief marketing officer. Although you're not a direct replacement for him, will you be picking up a lot of his responsibilities?

My position is almost a complete overlay of Bob's. The main difference is that instead of having a traditional hierarchical structure, we will have a matrix structure and different programs will be run out of different offices.

Of the independent software vendors and hardware vendors that have announced intent to participate in the branding program, how many have products that comply now?

We've had approximately 200 products declared conformant by their owners. But I have to draw a distinction between hardware branding and application software branding.

Has there been any official statement of support for the branding program by the federal government? Is that something we will see the government specifying in the near future?

Well, Roger Cooper of the Treasury Department was quoted as saying that he was going to use portions of the X/Open Common Application Environment in Treasury procurements.

How would you define X/Open's relationship with other open systems groups? The one that comes to mind the most these days is the Open Software Foundation.

We believe that we should all work together rather than working at cross-purposes. We also think we're a lot closer together than most people realize already.

What are the distinguishing factors between the two, other than the fact that OSF is developing a product and you are specifying standards?

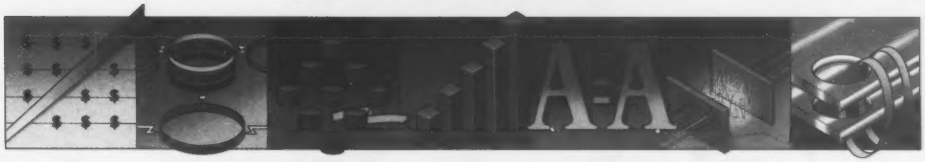
That's an obvious difference. Another difference with X/Open is that we're further along in our program than they are — we're a much more mature organization. We are currently on Version 2 of the Portability Guide, and real procurements have been made based on it.

We're going to be issuing Version 3 in the fourth quarter of this year. That will achieve full convergence with Posix and will expand the scope of the CAE.

How do you think the whole AT&T/OSF saga has affected the industry? For better or worse?

I think it's unfortunate that we don't have a common Unix. I think that everyone in open systems computing would like that. And on the other hand, I think that all of the participants are sincerely motivated in doing what they've done. Now, the question is, what can be done today to bring things closer together?

OLTP fundamentals.



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C12G01

Savage

CONTINUED FROM PAGE 25

peripherals. But there's nothing sexy about the new systems. The mainframes don't live up to the CPU speed of NAS competitors Amdahl and IBM, and the bells and whistles sound more like kazoos.

Analysts say that the lack of something sexy in the new line will prevent Amdahl and IBM customers from jumping ship. However, NAS offered serious list price reductions for those interested in the line.

At the low end, the difference is less than $100,000, but at the high end — the top-of-the-line AS/EX 100 — there is a $3 million difference in list prices from last year.

Now, the operative word here is "list price." NAS watchers have said that their earlier list prices have been way out of line with the actual selling price and that the new list prices are more in line with reality.

If the price is the sexiest thing about the mainframes, then that beauty is undercut by the machines' residual value, which is said to plummet quickly after purchase. A customer shopping for a new mainframe and considering both NAS and IBM might be moved to purchase the more expensive IBM machine because it will retain more of its value at resale time.

Why do the NAS processors, known to be reliable, lose their value so quickly? Maybe it's something the spin doctors could fix. Market observers say it's the public perception of the NAS machines, not the processors themselves.

Savage is a *Computerworld* West Coast correspondent.

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Bruce

CONTINUED FROM PAGE 29

quirements. Do you want to run what-ifs that merge cost data with varying levels of annual purchases?

The absence of products meeting B2 specifications has not, of course, prevented defense contractors from doing classified computing.

To date, each classified application has been controlled through physical, procedural and software access restrictions that are approved by the Department of Defense (DOD) on a case-by-case basis.

Such controls, however, have proved costly: maintaining two separate classified applications on one CPU, for instance, may currently mean running each one on a stand-alone basis, maintaining separate copies of the operating system for each application and scheduling system access on separate days for each system's users.

Meeting specifications

A system that met B2 specifications could rely on software controls in the operating system to segregate the classified applications and their users, eliminating the need to run on a stand-alone basis for each.

On the defense contractor's side, the impetus to move to B2 processing would be the lower cost resulting from increased user access and decreased system maintenance, as well as greater ease in obtaining DOD approval for classified work.

The defense contractor, freed from the need to maintain separate systems and software for classified computing, will be passing many of his costs for doing classified work back to the software vendor, which must now maintain look-alike copies of its products for the classified environment.

Will they bother?

If the result of this cost transfer is inordinately higher prices for "trusted" software, defense contractors might not see any benefit in converting.

While it may not happen right away, I think most vendors that intend to support B2 security will find the cost of maintaining two versions of the operating system and other basic products to be exorbitant.

I think mainstream products that support B2 security will gradually but inevitably force vendors to accommodate the design of many more products to the demands of the system security interface. As each new B2-level product is released, the problem of incompatibility with existing software will become more clearly visible.

The arrival of B2 security is something I eagerly anticipate. The lack of leadership in planning for its inevitable impact is a matter of concern.

Bruce is a computer security and disaster recovery planning officer at a Los Angeles aerospace firm.

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Vaxcluster

CONTINUED FROM PAGE 29

sponse time 4½ sec. or less for this application is considered good. Anything above that means users will be unhappy.

"In the prior setup, we were way above the 4½ margin," Lego said. "Now there are virtually no complaints about response time." The earlier Vaxcluster consisted of two VAX 8700s and several smaller models.

The current high marks for the cluster followed what was described as a very easy installation in mid-April during a 63-hour period occurring between Friday and Monday.

When the first of the more than 1,700 researchers and scientists logged on Monday morning, it appeared as if nothing had happened. More than 2,000 personal computers, printers and assorted devices hummed seamlessly, the way they had the week before.

Only two things gave indication of the big switch: the MIS department had expanded its processing capability with a more easily managed system, and the accounting staff would happily note that they had saved nearly $3 million by dispersing the older equipment to subsidiary offices. Two weeks later, the transition was announced in the company newsletter. The desire to replace its original Vaxcluster of two 8700s, two 8650s, four 11/785s and two 11/750s did not come as a need for speed, Calhoun said, but as a desire to grease the gears of systems management.

"Before, we had to tune five separate machines," Lego said. "With the new setup, we find a tuning parameter that works well on one machine and move it across the rest."

The MIS department had originally kicked around the idea of purchasing some more 8700s before DEC representatives sold them on the idea of the 8978, which is a Vaxcluster of eight 8810s.

Preparation began months in advance. Blueprints of the MIS department were studied and an "extremely detailed" project plan was worked out.

Time was of the essence, Lego said, and there was little room for mistakes. "We had a couple of sticky problems," he said. "First of all, the new machines were going to occupy the same floor space as the old ones. Second, it was imperative that we not interrupt service."

The old machines were not destined for the scrap heap. "We had other subsidiaries that were dying to make use of the outgoing machines," Lego said.

NEW PRODUCTS — SYSTEMS

Processors

In an effort to increase performance for its 8850-based data entry systems, **Nixdorf Computer Corp.** has unveiled a processor board designed to enhance both data entry and database applications.

The **CMX-3** reportedly allows as many as 80M bytes of block moves and has 512K bytes of on-board memory. The product also includes 384K bytes of cache memory and a 20 Nova million instructions per second processor, the vendor said.

The CMX-3 costs $14,000.

Nixdorf Computer, 300 Third Ave., Waltham, Mass. 02154. 617-890-3600.

Opus Systems, a supplier of Unix systems for IBM Personal Computers, PC XTs and ATs and compatible machines, has unveiled two additions for its Series 200 Personal Mainframe products.

The **260PM** and **270PM** are based on National Semiconductor Corp.'s 32532 processor and provide simultaneous use of Microsoft Corp.'s MS-DOS and AT&T's Unix System V operating systems at speeds up to 10 million instructions per second (MIPS), the vendor said. The 260PM operates at 25 MHz and offers 8½ MIPS of performance, while the 270PM operates at 30 MHz and provides 10 MIPS. Both systems incorporate 32381 floating-point processor architecture.

The 260PM is priced from $15,180; the 270PM is priced from $16,280. The product is targeted at systems integrators, value-added resellers and OEMS.

Opus Systems, Bldg. 400, 20863 Stevens Creek, Cupertino, Calif. 95014. 408-446-2110.

Data storage

Contour Computer Services, Inc. has introduced a line of high-capacity storage subsystems specifically designed for use with Sun Microsystems, Inc.'s workstations.

Dubbed the **Series 6000** family, the products are reportedly offered with 5¼-in. Winchester Systems, Inc. drives and will be offered in 155M- and 327M-byte configurations. A stand-alone 60M-byte cartridge tape subsystem is also available. The 6000 series features data transfer rates of up to 15M bit/sec. and access times up to 3 msec, the vendor said.

The Series 6000 units are priced as follows: $3,995 for a 155M-byte disk; $5,590 for a 327M-byte disk; and $2,495 for a 60M-byte cartridge tape subsystem.

Contour Computer Services, 758 Sycamore Drive, Milpitas, Calif. 95035. 408-434-9290.

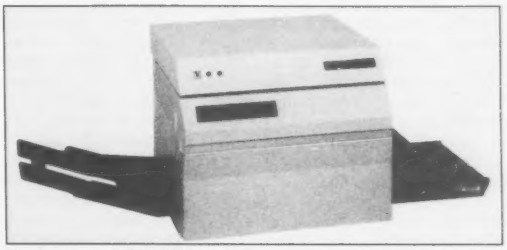
I/O devices

Versatec, Inc. is now offering an interface board that supports output to Versatec electrostatic plotters from Digital Equipment Corp. Q-bus computers.

The **Model 127** with software driver is said to support output from the DEC Microvax I and II and the Microvax 3000 series to any Versatec monochrome or color printing or plotting device. A driver and diagnostic package are included, and the package supports data records up to 32,768 bytes long and spooling support under VAX/VMS Version 4, Ultrix 2.2 and University of California at Berkeley Unix 4.3 operating systems.

The Model 127 costs $2,300.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051. 408-988-2800.



Varityper's *VT600W laser printer*

Varityper has unveiled the **VT600W**, the latest model of the company's 600 dot/in. Adobe Systems, Inc. Postscript laser printer.

The device outputs on plain paper up to 11 by 17 in. and is especially appropriate for computer-aided design drawings, newspaper publishing and financial reports. The product ouputs letter-size documents at 10 page/min. and ledger-size documents at 7 page/min., the vendor said.

The VT600W costs $22,995, and the product comes with 35 Adobe Postscript fonts preloaded on a 20M-byte Winchester Systems, Inc. disk.

Varityper, 11 Mt. Pleasant Ave., East Hanover, N.J. 07936. 201-887-8000.

A large-screen projector with automatic scanning capability has been announced by **Panasonic Industrial Co.'s Video Systems Group.**

Dubbed the **PT-105 Datamaster**, the projector can be used with Panasonic Pro Series S-VHS equipment and provides a bright picture of 550 lumens (at white peak) and a horizontal resolution of 1,100 lines (red-green-blue) and 650 lines (vid-

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eo). The unit can accept virtually any computer scanning frequency from 15 to 37 KHz horizontally and 50Hz to 100Hz vertically, the vendor said. It adjusts automatically when driven by any standard IBM Personal Computer, PC XT and AT or Personal System/2 Color Graphics Adapter or compatible board.

The PT-105 costs $9,950.

Panasonic Industrial Co., Video Systems, One Panasonic Way, Secaucus, N.J. 07094. 201-348-7183.

Schlumberger Instruments has announced a complete workstation for dynamic signal analysis, the **SI 1220.**

In addition to traditional Fast Fourier Transform analysis, the unit also offers swept sine frequency response analysis, logarithmic analysis and octave analysis. The system is especially suited to applications in acoustics, structural and environmental testing and control system analysis, the vendor said. The 1220 is available in two- or four-channel configurations and can reportedly analyze all four channels to 50 KHz with 500-line resolution.

The SI 1220 costs $18,250.

Schlumberger Instruments, 20 North Ave., Burlington, Mass. 01803. 800-225-5765. In Mass., call 617-229-4825.

A digital lettering system that can create laser-printer quality lettering on adhesive-back tape has been announced by **3M Co.**

Called the **8860 Digital Lettering System,** the product can reportedly use as many as three fonts at once. The Helvetica typeface is built into the system, and the user can insert two additional cartridges and mix letters and symbols of varying sizes on the same line of type. Type size can be adjusted from 6 to 60 points, and more than 380 typeface variations can be created from a single font, the vendor said. The system features 32K bytes of random-access memory.

The 8860 Digital Lettering System costs $2,195.

3M Co., Audio Visual Division, 3M Center, 225-3N-01, St. Paul, Minn. 55144. 612-733-0482.

A spooler/collator that allows laser printers to print multiple collated copies of multipage documents at a remote site is now available from **Advanced Technologies International (ATI).**

The device collates as many as 99 copies of a 99-page document and is compatible with the DW-2 and DW-3 series of ATI printers. It is available in two versions: the **SP-1**, with 512K bytes of random-access memory, costs $1,295, while the **SP-2** comes with 1M byte of RAM and sells for $1,495.

Advanced Technologies International, 355 Sinclair-Frontage Road, Milpitas, Calif. 95035. 408-942-1780.

Advanced Technologies' *SP-1*

Power supplies

International Computer Power has introduced the **Rotoplus Load/Line Isolator** for commercial and defense-industry applications.

According to the vendor, the Isolator is aimed at facilities requiring protection from industrial espionage, breach of security and unauthorized access to confidential records and proprietary data. It is said to assure 100% isolation for common-mode and transverse-mode signal paths and does not need air conditioning.

The Rotoplus Load/Line Isolator costs from $2,000 to $20,000 depending on configuration.

International Computer Power, 501 S. Michillinda Ave., Pasadena, Calif. 91107. 818-793-8656.

Deltron, Inc. has expanded its line of power protection products to include transient voltage surge suppressors.

The **Powermedic** includes an audible alarm that alerts users to a power failure. The device is available in both four- and six-outlet configurations and plugs into any standard 120 VAC power outlet. The product will protect computers, electronic office equipment, telephone lines and medical diagnostic systems from surges, spikes and transients, the vendor said.

The Powermedic four-outlet version is available for $55.99; the six-outlet unit costs $59.99.

Deltron, P.O. Box 1369, Wissahickon Ave., North Wales, Pa. 19454. 215-699-9261.

L-Com Data Products has announced a series of data line surge protectors developed specifically for Wang Laboratories, Inc. workstations.

The **LPW** series protectors provide a suppression circuit to guard against lightning and other electrical disturbances and cost $77 each.

L-Com Data Products, 1755 Osgood St., North Andover, Mass. 01845. 508-682-6936.

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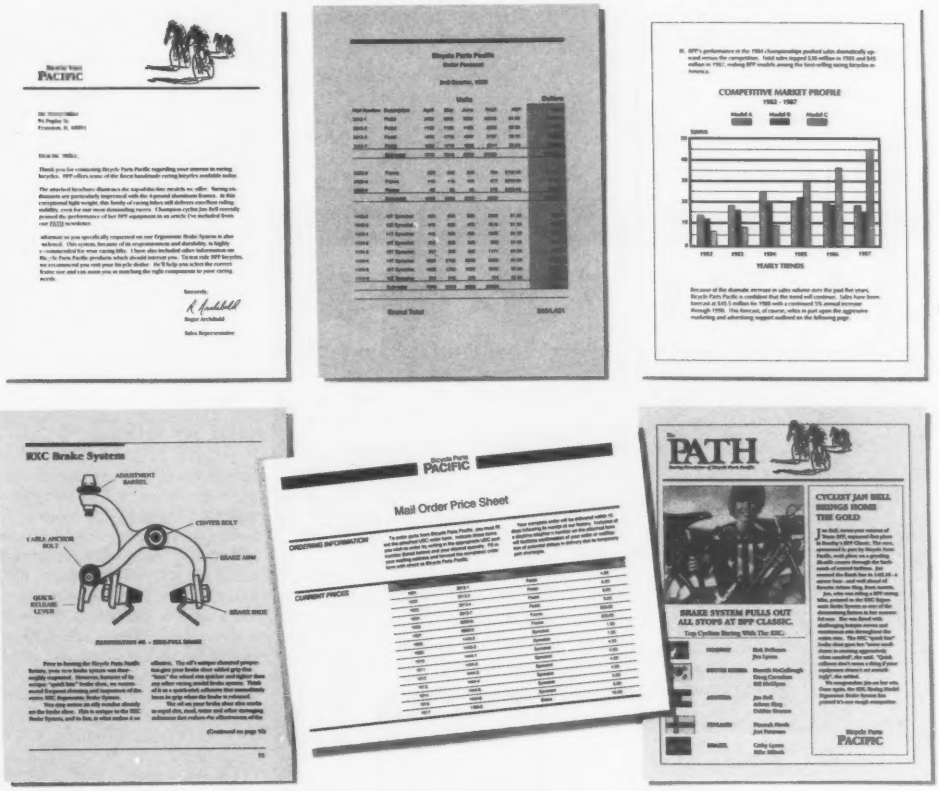

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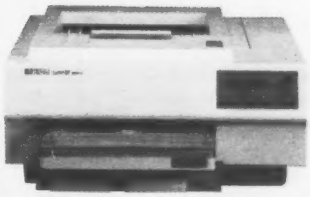

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Print samples were created using Microsoft Word, Microsoft Excel, and Aldus PageMaker.

NEW PRODUCTS — SOFTWARE

System software

Security Dynamics, Inc. has announced the **ACM/6100 Access Control Module** for IBM MVS systems. The software works with the firm's Securid card to provide user identification and authentication at mainframe sites running the MVS or MVS/XA operating system.

The module reportedly runs as a VTAM application and was designed to stand alone or front-end popular privilege definition and audit packages. Each user requiring access to the MVS host is assigned a Securid card that displays a one-time-only card code every 60 seconds.

The ACM/6100 Access Control Module is priced from $22,500.

Security Dynamics, 2067 Massachusetts Ave., Cambridge, Mass. 02140. 617-547-7820.

Nixdorf Computer Corp. has introduced an operating system for its 8850-based data-entry systems, the company said.

Called **Didos**, the software is said to include a full-screen editor, a second magnetic-tape buffer, a printer locking and unlocking program and a memory-dump utility. The product also offers IBM 3270 and 3770 communications support.

Didos is available for a monthly license fee of $85 to $300, depending on options.

Nixdorf Computer, 300 Third Ave., Waltham, Mass. 02154. 617-890-3600.

Database management systems

A software product that automatically builds Cullinet Software, Inc.'s IDMS/R databases is available from **DBMS, Inc.**

The **Test Database Builder** requires the user to define selection criteria for extracting entities from an existing database, which then automatically extracts the information to generate the new database. According to the vendor, this eliminates the need to write special programs or build new database structures.

The Test Database Builder costs $24,900.

DBMS, 600 Olympian Office Center, 4343 Commerce Court, Lisle, Ill. 60532. 312-961-5700.

Development tools

Interactive Development Environments, Inc. has introduced **Version 4.0** of **Software Through Pictures**, its integrated multiuser computer-aided software engineering product.

Key features include graphical editors, document preparation, object annotation and code generation. The package also offers support for DOD-STD-2167.

Software Through Pictures 4.0 costs $11,000 and is available for Apollo Computer, Inc. machines, Digital Equipment Corp. Vaxstations (under VMS and Ultrix), Hewlett-Packard Co. 9000s and Sun Microsystems, Inc. workstations.

Interactive Development, 12th Floor, 595 Market St., San Francisco, Calif. 94105. 415-543-0900.

Introl Corp. has introduced a C cross-compiler system that supports both C and assembly language development for embedded microprocessor applications.

Introl-C reportedly includes a relocating macro cross-assembler, an object-module linker, a hex file conversion utility and a source- and object-code module librarian. Host systems supported include Digital Equipment Corp. VAX and Microvax machines, Apollo Computer, Inc. and Sun Microsystems, Inc. workstations, Apple Computer, Inc. Macintoshes and the IBM Personal Computer XT, AT and compatibles.

Introl-C costs from $2,000 to $10,000, depending on the host computer.

Introl, 647 W. Virginia St., Milwaukee, Wis. 53204. 414-276-2937.

GE Calma Co. has extended its solids modeling product to enable users to create a translucent image of a solid.

Prism/Solids' translucency feature was designed to display the complex internal detail of a part and can be used to highlight a certain component of an assembly, the vendor said. The latest release allows users to create wire-frame geometry such as lines, arcs and splines; a multiview drawing can be created from a three-dimensional drawing by performing hidden-line removal operations on each view.

Prism/Solids is priced at $9,500. Enhancements are available to existing customers at no extra charge.

GE Calma, 501 Sycamore Drive, Milpitas, Calif. 95035. 408-434-4000.

Envos Corp., formerly the Xerox Artificial Intelligence Systems Business Unit, has announced that two major Xerox-developed software packages for the LISP programming language have been ported to Sun Microsystems, Inc.'s Sun-3 and Sun-4 families of workstations.

The **Medley** system was previously called the Xerox Artificial Intelligence Environment (XAIE). Medley is an advanced development environment for

Continued on page 42

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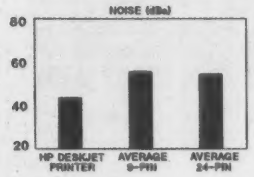

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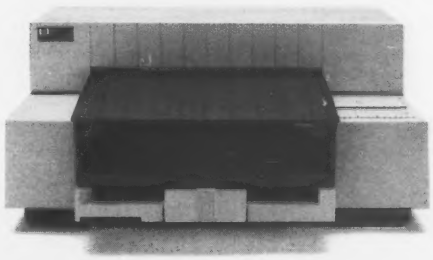

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Continued from page 40

LISP, while **Loops** is said to provide object- and access-oriented programming extensions for Medley.

Medley costs $10,000 for a single license and will be available to run on the Sun-3 workstation Oct. 1. Loops is currently available and costs $7,000.

Envos, 1157 San Antonio Road, Mountain View, Calif. 94043. 415-966-6200.

Information Concepts, Inc. has released **Version 88.1** of **FSP**, the company's full-screen processor, forms- and menu-manager software.

The latest release reportedly includes a library of functions for applications developers and a command-level interface for systems administrators and prototyping. The product runs across several operating environments, including Unix, Xenix, Digital Equipment Corp.'s VMS and Microsoft Corp.'s MS-DOS.

FSP Version 88.1 costs $395 to $795.

Information Concepts, 2nd floor, 1413 K Street N.W., Washington, D.C. 20005. 202-682-0330.

Languages

Battelle recently released a personal computer-based natural language software package for the IBM Personal Computer, PC XT, AT and compatible systems.

Designated **NQL**, the software serves as a natural language interface to database management systems residing on the mainframe and reportedly enhances the utility of any DBMS by making it more accessible for users with varying levels of expertise.

Features include dialogue capability, retrieval heuristics and DBMS and domain independence. The program requires 512K bytes of memory and an asynchronous communications port.

NQL costs $500 per copy.

Battelle, 505 King Ave., Columbus, Ohio 43201. 614-424-5570.

Mips Software Development, Inc. has announced that its **Dyalog APL** interpreter is now available to run on Sun Microsystems, Inc. Sun-4 and Sun 386I machines.

According to the vendor, Dyalog APL is a complete implementation of the APL language designed to run under the Unix operating system. The interpreter is written in C and reportedly offers nested arrays, a full-screen editor and a session manager. **Version 5.2** can now be ported to Sun systems running SunOS 4.0 or higher. SunOS is a converged version of AT&T's Unix System V and University of California at Berkeley's Unix 4.2 and 4.3. Dyalog APL costs $5,500 on the Sun 4 and $3,500 on the Sun 386I.

Mips Software Development, Suite 10, 33493 W. Fourteen Mile Road, Farmington Hills, Mich. 48331. 313-661-4565.

A fourth-generation language and database management system designed specifically for Unix operating systems has been announced by **Binary Research, Inc.**

Called **Apogee QP/UX**, the product reportedly provides full-screen editing of ASCII files and includes an interpreter that contains utilities for optimizing program code. A C translator is also included to accelerate program development.

Apogee QP/UX costs $2,500.

Binary Research, P.O. Box 57, Ft. Washington, Pa. 19034. 215-233-3200.

A Modula-2 language system designed specifically for the Hewlett-Packard Co. line of HP 9000 Series 300 workstations is now available from **Ana-Systems.**

Called **Modula-2/68**, the product is reportedly suitable for professional software development or academic instruction on systems incorporating the Motorola, Inc. family of 32-bit microprocessors. Program modules can be compiled separately, and an executable process can be built by linking with previously compiled program modules or by linking with library procedures written in C. The standard C libraries are easily accessed by the Modula-2 program, allowing modules to use previously written and debugged subroutine libraries in other languages.

Modula-2/68 costs $1,200 plus shipping charges.

Ana-Systems, P.O. Box 4759, Foster City, Calif. 94404. 415-341-1768.

A fourth-generation language productivity tool for the IBM Application System/400 has been introduced by **Michaels, Ross and Cole Ltd.**

The **AS/400 MRC-Query Series** was designed to enable both programmers and end users to generate AS/400 reports and applications using either AS/400 data or data files and on-line applications migrated from IBM System/36 or 38 machines. Extracted data is displayed in free-formatted reports and graphs in either on-line or hard-copy formats.

The AS/400 MRC-Query Series is priced from $3,000 to $35,000, depending on system configuration.

Michaels, Ross and Cole, Bldg. E, Suite 304, 800 Roosevelt Road, Glen Ellyn, Ill. 60137. 312-790-5048.

Progress Software, Inc. has announced a distributed processing version of its Progress fourth-generation language and relational database management system.

The software was developed for heterogeneous networks of computers concurrently running Microsoft Corp.'s MS-DOS and Xenix operating systems.

Progress/D for DOS/Xenix networks allows users to configure a

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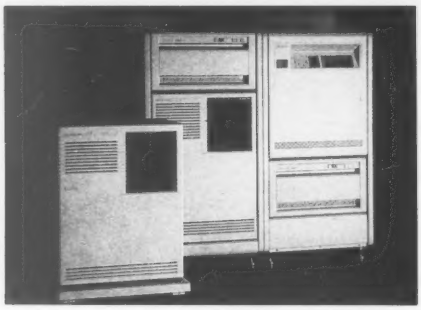

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- MicroVAX 3600's 40-inch cabinet holds one 622-Mbyte disk and one 296-Mbyte tape and has room for two optional RA disks.
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network with the Progress relational DBMS residing on a Xenix-based server and with the client processes resident on Xenix, Unix or DOS platforms.

According to the vendor, the software can be used by MIS professionals, government agencies and consultants to develop transaction-oriented business applications.

Progress/D for DOS/Xenix is priced according to machine type. A five-user version typically costs $1,700.

Progress Software, 5 Oak Park, Bedford, Mass. 01730. 617-275-4500.

Applications packages

Structural Dynamics Research Corp. has extended its mechanical computer-aided software engineering system, **I-Deas**, to include plastic-injection molding simulation and numerical-control processing.

The **I-Deas for Plastics** modules are said to combine part design with the simulation of the plastic molding process. The module can be used to perform both mold filling and cooling analysis. According to the vendor, the system will initially be available to run on Digital Equipment Corp. computers and workstations and is scheduled for release in the third quarter.

The program can be licensed for a one-time charge of between $25,000 and $35,000 per simultaneous user.

Structural Dynamics Research, 2000 Eastman Drive, Milford, Ohio 45150. 513-576-2400.

BBN Software Products Corp. has released **Version 8.3** of **Dataprobe**, its times-series analysis software for engineers and analysts working in a Digital Equipment Corp. VAX environment.

The software runs under the VMS operating system, and the current release includes a file-server function that gives analysts direct access to data files not in Dataprobe format, the company said. The file server also eliminates the need to write custom code for time tag, record-header identification and data reformatting. Dataprobe software is reportedly used to analyze data from flight testing, telemetry, wind-tunnel testing and similar applications.

Dataprobe 8.3 is priced from $30,000 to $75,000 in single units.

BBN Software Products, 10 Fawcett St., Cambridge, Mass. 02238. 617-873-5000.

Timeline, Inc. has released **Version 1.4** of its **Timeline Purchase Order** and **Accounts Payable** system.

The Timeline Financial Accounting System was designed for the Digital Equipment Corp. VMS operating system.

New Accounts Payable functions include automatic generation of discounts at check-writing time and immediate check printing directly from the journal entry file. Recurring payment transactions can also be generated automatically.

The Purchase Order system now offers the user the option of full or partial general-ledger coding, and unlimited text libraries can be developed as standard information to be included in the purchase order.

The Purchase Order and Accounts Payable package costs from $10,000 to $32,500, depending on system size.

Timeline, Suite 106, 3055 112th Ave. N.E., Bellevue, Wash. 98004. 206-822-3140.

Goal Systems International, Inc. has introduced a computer-based reference software system.

Called **Preference**, the mainframe-resident product reportedly provides the ability to create and maintain mainframe-based reference material and deliver it to users.

According to the vendor, almost any type of reference format may be created, including corporate policy manuals, procedures and training manuals and applications documentation. Features include a table of contents, an index and a context-sensitive Help facility.

Preference is available at an introductory price of $70,000 for a permanent license, which includes one year of maintenance and four days of on-site training.

Goal Systems International, 7965 N. High St., Columbus, Ohio 43235. 800-848-4640.

Parameter Driven Software, Inc. has announced **PDS-Adept** and the **General Business** and **Accounting** modules for the Unisys Corp. 6000 series of Unix-based hardware.

The Unix version of PDS-Adept reportedly incorporates the industry standard C-ISAM. Several general business and accounting modules are now available to run under Unix, including General Ledger, Accounts Payable and Accounts Receivable. Asset Depreciation, Order Entry and Invoicing, Inventory and Purchase Orders modules are also available.

PDS-Adept costs $2,600. A runtime module is also required. The General Business and Accounting modules are priced at $1,500, plus the cost of the runtime module. The runtime module itself costs between $900 and $6,150, depending on the number of users.

Parameter Driven Software, Suite 3820, 30800 N. Telegraph Road, Birmingham, Mich. 48101. 313-540-4460.

Britz Publishing, Inc. has introduced **Unilabel**, a software tool designed to print labels from any IBM System/36 file.

The product produces label-printer programs based on the file description, and labels can be printed one, two, three or four across. The software generates

Continued on page 44

Why We're Betting a Million Lines of Code on the SAS/C™ Compiler.

At SAS Institute Inc., we've invested more than 10 years of research—and over a million lines of code—in the SAS® System, the world's leading data analysis software. So you can bet we left nothing to chance when we chose the C language for the next generation of our software.

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- Support for signal handling including program checks and terminal interrupts, and non-standard signals such as timer interrupts and stack overflow
- Many built-in functions including string handling
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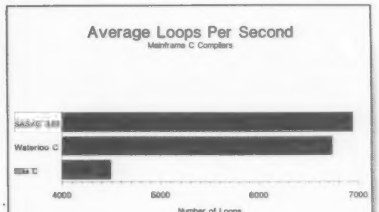

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Mail to: SAS Institute Inc., Attn: CC, SAS Circle, Box 8000, Cary, NC, USA, 27512-8000

Continued from page 43

RPG II source code, which is automatically compiled. The product is available on either 8-in. or 5¼-in. disks.

Unilabel costs $99.

Britz Publishing, 1814 Capital Towers, Jackson, Miss. 39201. 601-354-8882.

Utilities

Sterling Software Inc.'s Systems Software Marketing Division has added new interfaces for three mainframe software packages to its quality assurance tool, **Comparex**.

According to the vendor, **Release 6.2.0**, of the maintenance, debugging and quality assurance products includes interfaces to Applied Data Research, Inc.'s Datacom DB, Pansophic System, Inc.'s Owl and IBM's DB2.

The software's interfaces reportedly permit direct comparisons of files from 25 different products and will compare both data and text files without record-length restrictions.

It also will automatically resynchronize after inserts and deletes. The product is currently shipping.

Comparex 6.2.0 is priced at $12,500 for the OS version and $6,000 for the DOS version.

A VM/CMS configuration of the product costs $5,500.

Sterling Software, 11050 White Rock Road, Rancho Cordova, Calif. 95670-6095. 916-635-5535.

M. Bryce and Associates, Inc. has developed a formal interface for its **Pride** information resource manager to the Nomad2 database management system and fourth-generation language. Nomad2 is marketed by Must Software International, Inc.

Pride is a software tool used to catalog and control corporate information systems and can also drive several DBMS packages, including IBM's DB2, Software AG of North America, Inc.'s Adabas, Oracle Corp.'s Oracle and others. The interface generates Schema Definition Statements required to create a Nomad2 database based on a set of inference rules from Pride IRM component descriptions. According to the vendor, the interface reportedly saves the database administrator significant time in producing Schema, Master, Segment and Item definition statements for Nomad2.

The interface is marketed as an option to Pride and costs $10,000. Pride costs $45,000.

M. Bryce and Associates, 777 Alderman Road, Palm Harbor, Fla. 34683. 813-786-4567.

Four utility packages for the IBM System/36 minicomputer are now available from **Amalgamated Software of North America, Inc.**

Manipul8 is a file editor that supports add, update and delete operations on files with an easy-to-use interactive system, the company said. The software incorporates several file-display options, such as hexadecimal and logical displays. Manipul8 costs $750.

According to the vendor, the **Termin8** software allows users to cancel all jobs, stop the job queue and stop the spool writer to gain a dedicated machine without operator intervention. All system termination can be done from a command line or as part of a procedure. Termin8 costs $500.

Recre8 was developed for System/36 users who utilize the Copydata and Reorg functions. According to the vendor, the software reorganizes files 100% faster than with native Copydata and costs $750.

Formul8 was designed to allow RPG programmers to use several operations, including exponentiation, square-root, logarithm and trigonometric functions. The software is priced at $500.

All four products are available individually or as a package.

Amalgamated Software, Suite 255, 4041 MacArthur Blvd., Newport Beach, Calif. 92660. 800-732-2070.

Six utility and office automation software packages for the Digital Equipment Corp. VMS operating system are now available from **Scherers Wizard Software**, a division of Scherers.

Called **Wiz Kits**, the software bypasses Digital Command Language syntax and is useful to both experienced and novice users, the vendor said.

The Scherers Wizard Utilities kits include Queue Wiz, Terminal Server Wiz, Copy Wiz and Process Wiz. The Office Automation Utilities include Calendar Wiz and Menu Wiz.

Each Wiz Kit includes an installation guide, an operating manual, a license and one hour of technical support.

Single-copy prices range from $295 to $495 per kit.

Scherers Wizard Software, 1308 Bardstown Road, Louisville, Ky. 40204. 502-456-4898.

An automated backup utility developed for Digital Equipment Corp. VAX systems has been announced by **C.R.T.** in Belmont, Calif.

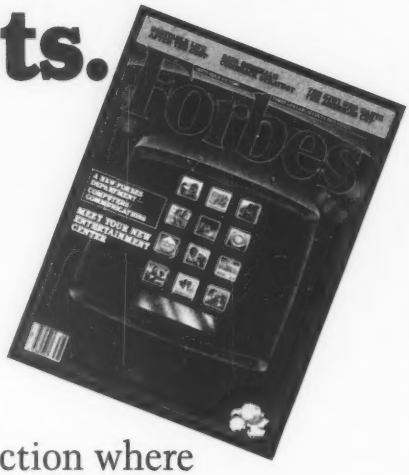
Called **Autobax**, the product is said to run on any VAX/VMS machine and will submit either full or incremental disk-to-tape backups in batch via interactive prompting.

According to the vendor, little or no knowledge of the backup utility is required and backup listings are created for easy verification. Operator intervention is reportedly minimal.

Autobax costs $25.

C.R.T., P.O. Box 271, Belmont, Calif. 94002. 415-595-5595.

Black boxes are too important to be left to the experts.



Your fate, your company's fate, increasingly will depend on knowing how to make the most of your computer screens. So **FORBES** has inaugurated a new every-issue Computer/Communications section where computer-wise editors will tell you not how computers work but how you can-must-most effectively use these machines and systems that are utterly transforming the economy and society.

For your company to survive you'll need to know what will be on FORBES Computer/Communications pages every other week.

This new FORBES editorial section will keep you up to speed on what is happening, what will be happening, what should be on your terminal screen if you are going to control your future.

Put your message in the magazine that tells it like it is. **Forbes** Capitalist Tool

MICRO BITS

Douglas Barney

Trash those MCA rumors

MCA stinks, till you lose data! Every cloner and his brother has been railing against the IBM Micro Channel Architecture as offering no advantages when running OS/2. Fortunately for them, no one has been running OS/2, because if they were, these statements would be exposed for what they are — rubbish.

Sure, IBM has failed miserably to make boards that exploit MCA's central benefits, such as multiple processor support and 32-bit addressing.

But if you take a closer sniff, MCA really doesn't smell so bad. What the MCA really does for OS/2 users is protect their data. IBM told me that, and like most promises, it wasn't quite believable. In fact, it looked like the trail of parcels a well-fed horse leaves behind. But then two hugely respected software developers explained why IBM was right.

Here's how it works. With today's so-called AT bus, interrupts are handled as they occur because the system was designed for single, linear-type tasks. But when people multi-

Continued on page 66

Are micros too hot to handle?

MIS resources lagging behind as demands of PC end users grow rapidly

BY DOUGLAS BARNEY
CW STAFF

It may not be as ominous as Soviet missiles in Cuba, but the constantly increasing demands of personal computer end users may well threaten the mental health of thousands of MIS information center staff, micro managers and other MIS professionals across the nation.

The central problem is the abundant success of the personal computer. As PCs entered the workplace, information centers were established and microcomputer managers hired. Unfortunately, PCs have continued to stream briskly into companies, while the resources to manage them have grown far too slowly.

The bottom line is that people who manage PCs are being asked to bite off far more than they can chew. "We are being told we have to do better support with the same amount of people," said Monte C. Sellers, manager of PC consulting at First Chicago Corp. The bank has 2,600 PCs and 14 to 20 people to support them.

Growing pains

But it is not just that there are more PCs and more users. As each user gains knowledge, the questions and problems become more complex. Add to that the growing complexity of the products themselves, and it is not hard to see that a growing and troublesome support crisis exists.

The problem is so widespread that the Chicago Association of Microcomputer Professionals (CAMP) held a meeting to air managers' grievances. At the meeting, attendees almost unanimously said things have simply gotten out of hand.

Despite a clear need, budgets to support PCs have not grown fast enough; in some cases, they have even been slashed.

"We can't handle users' demands and the technical complexity of the demands. Information centers haven't grown, but demand has," said Julian Horwich, president of CAMP. "Never mind OS/2, LANs and micro-to-mainframe links."

Rather than give up, managers have scraped for any and all solutions. One approach is to designate sophisticated end users as local gurus and let them answer the bulk of the questions.

Continued on page 67

Add-ons simplify 1-2-3

BY WILLIAM BRANDEL
CW STAFF

Users expecting advanced features from future versions of Lotus Development Corp.'s 1-2-3 can stop waiting. Two small add-in suppliers recently beat the spreadsheet giant out the door with products that give today's 1-2-3 a graphical user interface and spreadsheet linking.

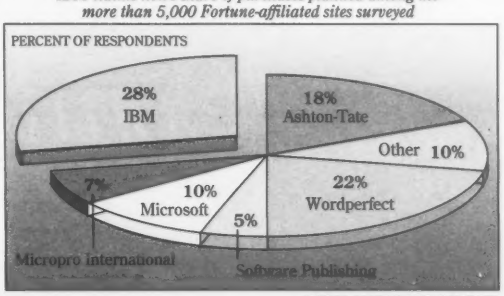
Marq Technologies in San Diego has announced its graphical interface, Marq Navigator for 1-2-3, which incorporates an easy-to-use mouse driver that reportedly speeds spreadsheet data entry and editing.

Continued on page 68

Data View

Top vendor choices for word processing

IBM claims lion's share of purchases planned among the more than 5,000 Fortune-affiliated sites surveyed



SOURCE: COMPUTER INTELLIGENCE
CW CHART

Finance execs rely on PCs

BY MICHAEL ALEXANDER
CW STAFF

Ever since an electronic spreadsheet triggered the personal computer revolution, financial executives have been among the technology's heaviest users. But until a joint research report conducted by the National Association of Accountants (NAA) and Arthur Young, it was not clear what impact PCs have had on corporate financial departments.

According to the study, 83% of financial executives are regularly using PCs. What is more, an overwhelming 98% say that PCs have added measurable value to their companies.

"The results of this survey in-

Continued on page 68

Inside

- Out with old, in with Microsoft's Excel 1.5. Page 49.
- Symantec's Timeline practices the fine art of sharing. Page 62.
- Stock brokers to see a brighter future with Quotron tools. Page 63.

CICS Educator Lemuel Skidmore Found A Better Way

Developing CICS applications is tough. You have to fight for tight mainframe resources. Slow response time kills productivity. And you live in danger of accidentally bringing the system to a crashing halt.

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Too good to be true? Don't say that to Lemuel Skidmore, President of Skidmore Resource Management in Clinton, CT. PC-CICS is the software product this educator and consultant relies on to make the most of his CICS training workshops.

"With PC-CICS, I don't have to worry about the availability of the mainframe. I don't have to worry about response time. And I don't have to worry about bringing down the mainframe CICS system. When students see what they can accomplish and how productive they are with PC-CICS, they're amazed," he says.

A great CICS training tool. A great CICS development tool. Skidmore knows. "When CICS goes down at a client site, users sit at the mainframe terminals twiddling their thumbs. In the meantime, I keep writing, compiling and testing CICS applications with PC-CICS. If I bring my system down, I just reboot the PC and keep on working."

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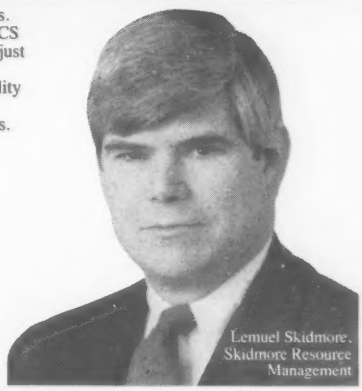
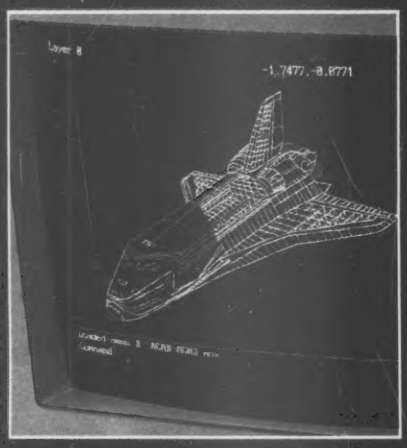


Lemuel Skidmore, Skidmore Resource Management

Multiuser bit-mapped graphics are the way of the future.



Make sure you don't get left in the dark.

Untouched photo of EGA screens. SunRiver Stations running off COMPAQ Deskpro 386/20

Make the LightConnection

Speed 386 graphics to every desktop with SunRiver.

At last, you can extend the power of a single 386 microcomputer throughout your workgroup, putting colorful bit-mapped graphics at each user's fingertips—without spending a fortune.

How? With the LightConnection from SunRiver Corporation. It increases the return on your 386 investment by spreading 386 power and speed throughout your department, for computer-aided design, desktop publishing, personal productivity, or any of a growing number of graphics-oriented applications.

You make the LightConnection with SunRiver's Fiber Optic Host Adapter, which simply plugs into a 386 host such as the COMPAQ Deskpro 386 and speeds its power along a highly reliable fiber optic link to as many as four SunRiver Fiber Optic Stations. With multiple SunRiver Host Adapters, each 386 can support up to 16 connected Fiber Optic Stations, offering a powerful, cost-effective, shared-processor multiuser solution.

When you make the LightConnection, information sharing and sophisticated graphics capabilities are virtually instantaneous. For the first time, bit-mapped DOS graphics—everything from Lotus 1-2-3 to desktop publishing programs like Ventura to AutoCAD—run under UNIX/XENIX as well as multiuser DOS. Popular applications that once were limited to the 386 console—including XENIX programs like SCO Professional, ARRIS and Innovative SmartWare graphics—are now at every desktop.

Protect your PC investment: the SunRiver PC LightCard.

If you currently own stand-alone PCs, XTs or ATs, don't worry, you aren't left in the dark. The SunRiver PC LightCard gives you all the information sharing and multiuser graphics that 386 power provides.

The PC LightCard fits into any 8-bit slot in your PCs, XTs or ATs and connects them by fiber optic link to the SunRiver Host Adapter in the 386.

When you make the LightConnection with the PC LightCard, you increase the return on your 386 investment and protect your PC investment while upgrading your equipment to a high-performance multiuser system. Your users enjoy the powerful multitasking applications of the 386 host while keeping their own familiar units and applications.

An easy connection.

The LightConnection is an easy one thanks to the plug-and-play simplicity of preterminated fiber optic cables. Installation usually is just a matter of minutes.

Plus, SunRiver's central upgrade point greatly eases security control and system maintenance as it diminishes the threat of obsolescence.

Designed around industry-standard processors and operating systems, the SunRiver System easily fits into your existing corporate environment and growth strategy.

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Don't be left
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To appreciate the full beauty and power of the LightConnection, you must see a demonstration. For the name of the reseller nearest you or to schedule a demo, please call. 1-800-635-8069

Reseller inquiries are welcome.

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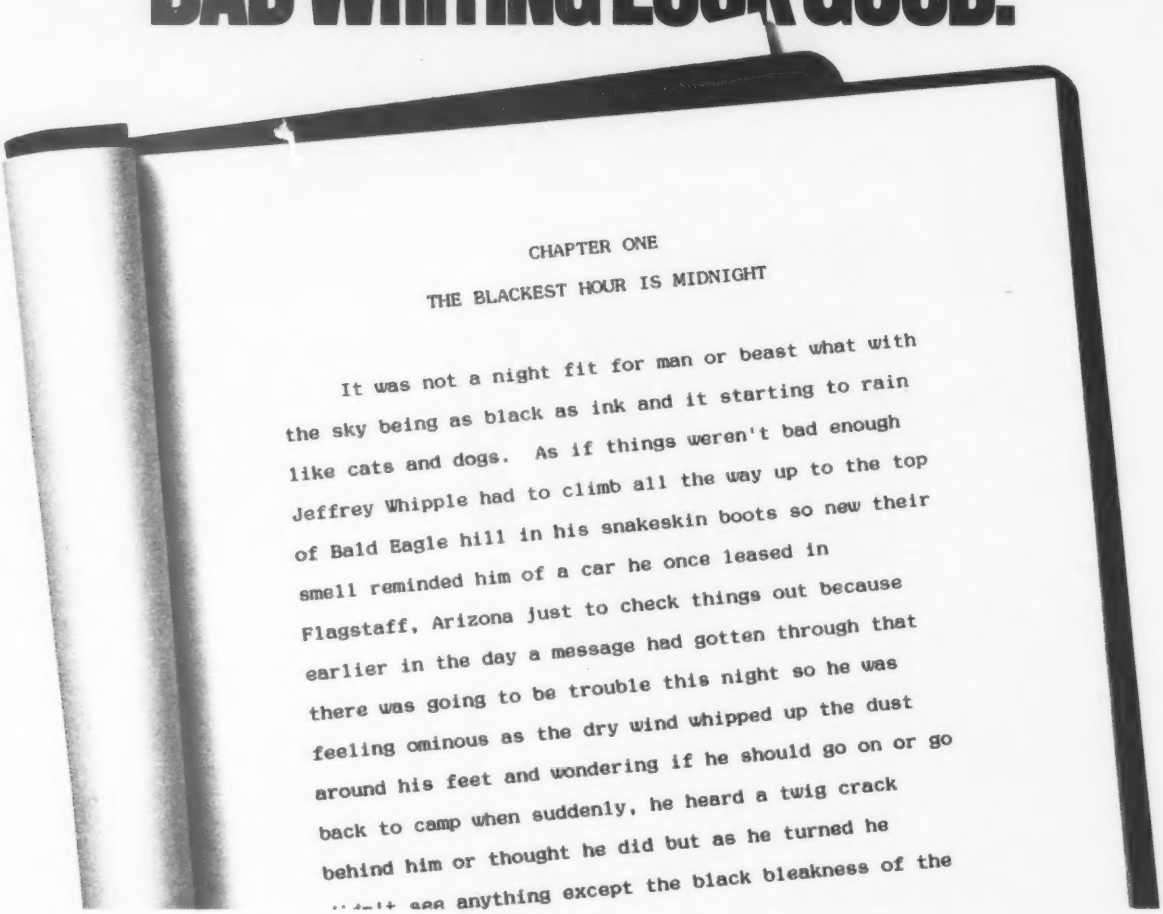

We're sorry that our new 24-wire Pinwriter® P5200 and P5300 printers can't do much for the quality of your writing. But they can certainly do wonders for the way it looks. The secret is the ribbon. Other dot matrix printers only use a fabric ribbon. Our Pinwriters print with both a fabric and a letter-quality, multi-strike film ribbon—the same kind used on executive typewriters.

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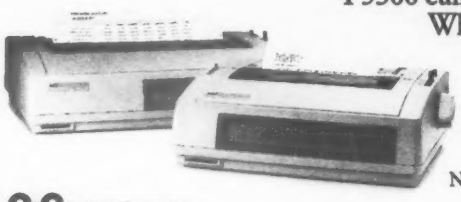


C&C Computers and Communications

NEC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719.

REVIEWS/NEW PRODUCTS

Excel second to none in Mac spreadsheets

With Version 1.5 of Excel, Microsoft Corp. redefines itself as the current leader in the Apple Computer, Inc. Macintosh spreadsheet market.

Features: On the whole, Version 1.5 is a worthwhile update. It fixes some bugs from the previous release, Version 1.06, and adds a few features and improved speed. Most important, this version adds full Multifinder support, which will work as a background task; a new Links command that replaces the older Open Links command; color printing; and support for Lotus Development Corp.'s 1-2-3, Releases 1A and 2.01, and PC-Excel Version 2.0 file formats.

Excel 1.5 also includes localized scrolling, financial-statement formats, an enhanced page-preview function, color display and chart options on a color Mac II, the ability to freeze split worksheet panes, an increase in the maximum number of data points for charts, a quick-creation facility for creating charts from multiple worksheet data selections, improved chart formatting, a dialogue editor and two new buttons (Next and Previous) in the Gallery menu to speed chart type selection.

Latest upgrade *runs faster, plays Multifinder in background*

Performance: Good to excellent. Excel 1.5 has a strong collection of analytical features. Functions for everything from matrix multiplication to linear regression are included, along with a random number generator and Boolean functions. Excel's macro language lets users modify built-in functions or create new ones to fit their needs. We rate Excel 1.5 as excellent for formulas and analysis.

Excel can read and write Lotus WKS and WK1 files, although it is not 100% compatible. When it encounters a 1-2-3 command or macro it does not understand, it flags the command so you can work with it yourself. It can read and write Sylk files and cut and paste information with other applications using the clipboard. This newer release will also read PC-Excel files directly. We rate its compatibility as very good.

Overall, Excel 1.5 is a bit faster than its immediate predecessor. It supports the Motorola, Inc. 68881 math coprocessor on the Mac II, which can speed recalculation dramatically. Naturally, Excel 1.5 also runs much faster on an 8M-byte Mac II since it is sensitive to the fast RAM, the faster 68020 CPU and a math coprocessor. We rate its speed as good.

The logical limitation to size is 16,384 rows by 256 col., quite roomy, given Excel's excellent consolidation and linking capabilities. We rate it as very good for capacity.

Excel's database features are similar to 1-2-3's. For text manipulation in the database, there are 21 text functions for string searching, substitution, case conversion and the like. Despite the inherent limitations of Excel's RAM-based database, we rate Excel's database functions as very good.

Excel continues to be the leader in spreadsheet graphics with the addition of display and printed color in this version. It includes full text and graphics printing and full support for Adobe Systems, Inc.'s Postscript as well as color printing on Apple's color Image Writer and Tektronix, Inc.'s Color Graphics Printer. Excel 1.5 rates a solid excellent in graphics and output capabilities. Excel 1.5's macro capabilities also rate as excellent.

Documentation: Very good. Excel 1.5 comes with the same basic manuals as the earlier releases. Manual supplements are included for the Version 1.5 changes and the dialogue editor. The printed manuals cover both tutorial and reference topics fairly well. A separate manual on macros, functions and arrays completes the information.

On-line Help is context-sensitive, slick and complete. There is no on-line tutorial.

Ease of learning: Very good. We did not need to read the manual to use the product

Continued on page 50

Excel 1.5

Price: $395

- Performance: Good to excellent
- Documentation: Very good
- Ease of learning: Very good
- Ease of use: Very good
- Error handling: Very good
- Support: Very good
- Value: Excellent

Note

Reviews are provided by the IDG News Service.

A full-featured, simple DOS shell isn't hard to find

A good DOS shell is fast and intuitive, and it doesn't get in your way if you need to access DOS directly. An ideal DOS shell includes extra features but doesn't force you to learn complicated commands. Peter Norton Computing, Inc.'s Norton Commander Version 2.0 comes close to being an ideal DOS shell.

Features: You can have Norton Commander running at all times, yet use it only when you want to. To issue a command at the DOS level, you simply start typing. By pressing cursor or function keys at any point, you can activate the window-oriented file manager. A new pull-down menu system works in conjunction with the function keys and control-key combinations.

Become a *Norton master in 15 minutes to an hour*

The term "point and shoot" fits the user interface. You can point to a file or group of files in the directory list and perform all the common DOS functions such as Erase, Copy and Rename.

Norton Commander allows you to display one or two directories simultaneously in separate windows and provides full control over file sorting.

You can compare the files in two directories and mark those files that do not exist or those that are more recent in the other directory.

Performance: Very good. The Norton Commander can run in either random-access memory-resident or reload mode. The resident mode is recommended

Continued on page 50

Peter Norton's Norton Commander Version 2.0

Price: $89

- Performance: Very good
- Documentation: Very good
- Ease of learning: Excellent
- Ease of use: Excellent
- Error handling: Very good
- Support: Very good
- Value: Excellent

Alpha poses as taskmaster

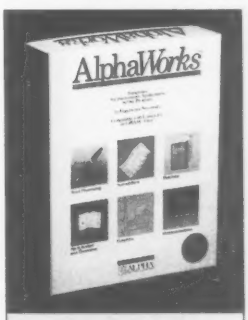
Alpha Software Corp.'s Alphaworks is a low-end integrated package. Although not as well integrated as other packages, it has powerful task-switching features and an excellent communications module.

Features: Alphaworks is an enhanced and renamed version of Electric Desk. It has individual modules for word processing, flat-file database management, spreadsheet analysis and telecommunications. It uses files from Lotus Development Corp.'s 1-2-3 and Ashton-Tate Corp.'s Dbase III Plus without modification.

The spreadsheet module supports worksheets of up to 255 col. by 8,192 rows and includes all 1-2-3 functions except macros. You can split the screen into two "viewports" to look at different aspects of your worksheet and make the two scroll together. The module supports pie charts and line, bar, stacked bar and X-Y graphs.

The word processor has a spelling checker and thesaurus, forward and backward search and replace, word count and very flexible formatting options.

Continued on page 51



Alphaworks

Price: $195

- Performance: Poor to very good
- Documentation: Excellent
- Ease of learning: Very good
- Ease of use: Very good
- Error handling: Very good
- Support: Satisfactory to good
- Value: Very good

DOS shell

FROM PAGE 49

for floppy-disk users and requires about 138K of RAM. The reload mode uses only 13K bytes of RAM. Commander works equally well with mouse or keyboard. Version 2.0 is 100% compatible with the earlier version.

Not only does the product do just about everything you need in terms of file management, the new tree display helps you navigate through even the most complex directory hierarchy.

There are a few features still lacking. Although the File-Find command will locate and display all the files that match your criteria, you cannot tag them all for subsequent action.

Also, it would be nice to be able to sort the directory entries in the tree diagram, and we would also like to limit the file display to selected files.

Documentation: Very good. The package comes with a reference manual and a smaller volume that provides a concise pictorial summary of the product. Both books are well designed and easy to read. In addition, rudimentary on-line Help is available.

Ease of learning: Excellent. Installation consists of copying four files to your hard disk or a working floppy. Even a novice can learn the basics of this product in about 15 minutes or master it within an hour.

Ease of use: Excellent. Norton Commander is intuitive and easy to pick up. The point-and-shoot interface will be familiar to most PC users, and in this version, mouse users can perform all functions available to keyboard users.

Error handling: Very good. Norton Commander improves on DOS's error handling. For example, Commander makes you verify your intentions before overwriting a file with a copy command.

Support: Very good. Unlimited toll-call telephone support is available. Norton Commander comes with a 90-day usability warranty with a 10% restocking fee. Bulletin board support is offered through Reader's Digest Association, Inc.'s The Source.

Our first two calls to technical support resulted in waiting five minutes on hold, followed by an opportunity to leave a recorded message. Our calls were returned promptly. On the third try, we got through right away. The technicians we spoke with knew the product well.

Value: Excellent. If you find yourself spending too much time struggling with file management, this is the product to buy. At $89, it stands out as the best all-around DOS shell on the market. For Version 1.0 users, Commander 2.0 is well worth the $33 upgrade fee.

Excel

FROM PAGE 49

effectively. It is easy to install on the hard disk. The pull-down menus are self-explanatory, and the intuitive nature of the interface makes Excel 1.5 as easy a spreadsheet to learn as any on the market.

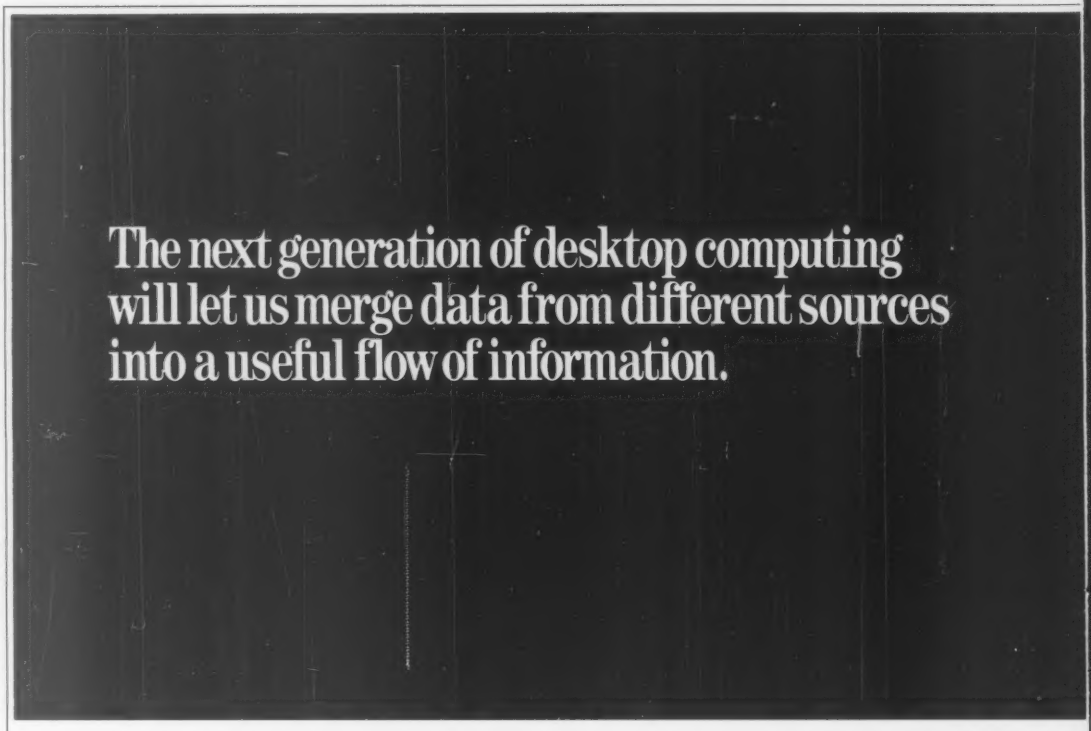
Ease of use: Very good. Excel has always been strong in ease of use, and Version 1.5 extends that tradition. Improvements over previous versions include the leaner Links command, the additional commands in the Charts Gallery and the addition of color on a Mac II.

Error handling: Very good. Excel 1.5 includes an Undo command that can save your hide. However, it lacks any kind of automatic backup feature. Excel's overall data integrity scores high.

Support: Very good. Microsoft offers unlimited free, but not toll-free, phone support 12 hours a day, as well as a newsletter and a Compuserve forum.

We called the technical support hot line twice during our review. Once we cleared the small hurdle of Microsoft's automated phone system, we got through to top-notch technicians.

Value: Excellent. On the Macintosh, Excel 1.5 does not have much competition from other spreadsheets. It retails for $395, and the update from previous versions costs $25. For all the features, performance and ease of use it provides, Excel 1.5 remains a best buy in microcomputer software.



© 1988 Metaphor Computer Systems.

Alpha

FROM PAGE 49

Alphaworks can keep as many as 29 tasks open at once, and you can toggle among them. It can use the Lotus/Intel/Microsoft Expanded Memory Specification, IBM Personal Computer AT extended memory or it can swap to a hard disk. There is a menu option that tells how much random-access memory and disk space is available for opening or holding more tasks.

Performance: Poor to very good. The spreadsheet is solid but unexciting; it stays close to 1-2-3 in functionality. Formulas and macros are entered in much the same way, and you can select recalculation options from a menu. Graphs are clear but not spectacular.

The word processing module is surprisingly full-featured, with almost everything but indexing and table-of-contents generation. The spelling checker and thesaurus are fast, and formatting options are flexible.

A typewriter feature sends text to the printer either line-by-line or character-by-character. On-screen page breaks are automatically updated as you edit a document, and form letters and other database-merge documents are easy to create. We rate the word processing as good.

The database module supports Dbase data types and functions but without Dbase's relational or programming capabilities. You can use a few simple if-then constructs to sort databases or generate reports. You can create several custom data entry screens for each data file; standard row-and-column reports are easy to set up.

In comparison to Microsoft Corp.'s Microsoft Works, Alphaworks runs very slowly. We rate speed as poor. Integration features are uninspired, earning a satisfactory rating.

Alphaworks earns a score of very good in additional features because of elaborate macro capabilities, the ability to access the operating system from any module and the communications module, which works like a charm.

Documentation: Excellent. Alphaworks has tutorial and reference manuals, a quick-reference booklet and extensive and well-organized on-line Help. Each manual has a detailed table of contents and a good index. On-line Help is context-sensitive, clearly written and several levels deep.

Ease of learning: Very good. The Alphaworks installation program would not work on a shared hard disk, and it locked up when we tried to install the program on an Intel Corp. 80286-based PC, but it worked fine on a 386-based PC. The company blamed a bug in early copies of the program and said it has been corrected.

Because of its excellent documentation and on-line Help, as well as its consistent and intuitive command structure, Alphaworks is exceptionally easy to learn.

Ease of use: Very good. The consistent menu structure of all Alphaworks' modules, its abundant speed keys, its macro capability, its ability to use 1-2-3 and Dbase III Plus files directly and its extensive on-line Help make Alphaworks a champ in ease of use.

Error handling: Very good. Alphaworks traps most user errors very well. It is virtually impossible to forget to save a file or to delete anything by accident.

Support: Satisfactory to good. Alpha Software provides free (but not toll-free) phone support to registered users weekdays from 9:15 a.m. to 5 p.m., Eastern Standard Time, as well as 24-hour support on its electronic bulletin board.

When we called for phone support, the average wait for a technician was about four minutes. Technical support staff seemed to differ widely in their product knowledge. However, our questions were always answered, even if it meant waiting on hold while the support rep asked someone else.

Value: Very good. For $195, Alphaworks is a well-documented and surprisingly full-featured integrated package. It offers robust word processing and database capabilities along with good report generation.

Your company undoubtedly has tremendous data resources. Metaphor's Data Interpretation System can help you turn them into a tremendous competitive advantage.

Metaphor's system is far more than an incredibly sophisticated, amazingly easy-to-use computer. It's a means of gaining a real edge in the battle for more business, through gains in professional productivity and enhanced business decision-making.

Metaphor is the only system that can give your key decision-makers direct access to multiple data bases. They will be able to readily transform raw data into meaningful information. And share the results with management and peers, quickly, easily. So decisions can be made in time to make a difference.

Metaphor's system makes a big difference for Information Systems professionals, too. Metaphor lets users build their own applications, so IS managers can turn their skills to more effectively managing the corporate information resource, rather than grinding out user reports and applications from a seemingly endless backlog of requests. And given Metaphor's proven understanding of end-user needs, IS gains a strong "support arm," too.

That's what customers at over 100 installations in the world's largest and most successful companies tell us. They've proved Metaphor's Data Interpretation System is a powerful business tool, giving them an enormous advantage over those who don't keep up with the latest technologies.

metaphor

Start the competitive advantage flowing to your company now, with Metaphor. Write us at 1965 Charleston Road, Mountain View, CA 94043, or call us toll-free at 800-255-5803 today.

NEW PRODUCTS

Systems

A rack-mount industrial personal computer bus has been announced by **Texas Microsystems, Inc.**

The **Model 3014** has a capacity of 14 IBM Personal Computer XT or AT plug-in boards in any combination, the vendor said. It also incorporates 1G byte or more of rotating memory in as many as five different drives and a 225W power supply.

The standard configuration accommodates 12 PC AT boards and two XT boards, but any combination can be supplied, according to the vendor. The Model 3014 costs $1,595 without CPU board.

Texas Microsystems, 10618 Rockley Road, Houston, Texas 77099. 800-627-8700.

Hyundai Electronics America has raised prices on its line of Intel Corp. 80286-based personal computers and monitors.

The increases pertain to the **Hyundai Super-286C** small-footprint IBM Personal Computer AT-compatible and the **Super-286**, a 12-slot file server and workstation. The Super 286C will be priced from $1,790 for a single 1.2M-byte floppy drive system with monochrome monitor. A single-floppy system with a 30M-byte drive will cost $2,440, and a 40M-byte configuration will cost $2,690, the vendor said.

Hyundai monitors will also be affected by the increase. The **HMM-1210** 12-in. monochrome unit will be priced at $145. The company's 14-in. Color Graphics Adapter and Enhanced Graphics Array monitors, the **HCM-1410** and the **HCM-1420**, will cost $485 and $645, respectively.

Hyundai, 4401 Great American Pkwy., Santa Clara, Calif. 95054. 408-986-9800.

American Mitac Corp. has begun U.S. delivery of the Mitac International Corp. 20-MHz **Paragon 386E** PC.

The system is said to include on-board SIO ports, a PIO port, a clock and a floppy disk controller.

The 2M bytes of standard on-board 32-bit random-access memory is expandable to 8M bytes, and the unit reportedly measures 15 by 16½ in. It can accommodate both 3½- and 5¼-in. disk drives, the vendor said.

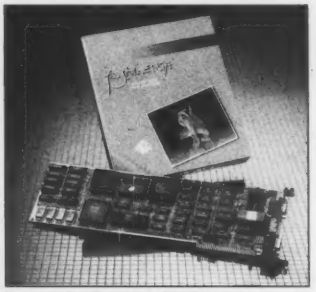
The Paragon 386E is priced at approximately $5,000.

American Mitac, 410 E. Plumeria, San Jose, Calif. 95134. 800-648-2287.

Software applications packages

Everex Systems, Inc. has released a graphic arts software package targeted at the IBM Video Graphics Array (VGA) market.

Called **Freestyle EVGA**, the package is said to use Everex's EVGA graphics adapter with a 256-color palette and 512-



Everex's *Freestyle EVGA*

by 480-pixel resolution. The VGA mode was designed to maintain compatibility with the Targa video standard, the vendor said.

The product will also read and write images in the Targa file format. Freestyle runs exclusively on EVGA, and graphics design tools include fonts, custom shapes and color cycle animation.

Freestyle costs $299. The Everex EVGA board costs $399.

Everex, 48431 Milmont Drive, Fremont, Calif. 94538. 415-498-1111.

A software package designed to allow corporations to enter, validate, distribute and collect a wide range of unstructured data has been introduced by **IMRS, Inc.**

Called **Finalform**, the package runs on IBM or compatible personal computers under DOS 3.0 or higher. According to the vendor, Finalform can be customized for a variety of business applications, including tax reporting, intercompany invoice control, product tracking and financial data collection. The system requires a hard disk and 640K bytes of memory.

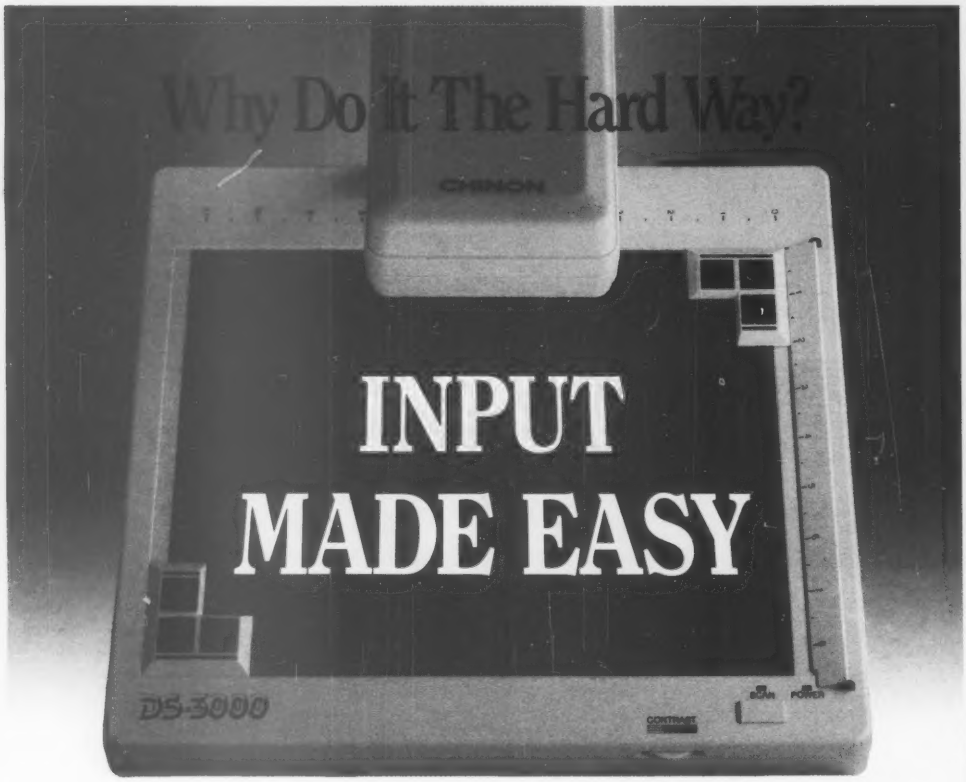
Finalform costs $40,000 for a headquarters site license.

IMRS, 1033 Washington Blvd., Stamford, Conn., 06902. 203-323-6500.

Strategic Software Planning Corp. has released **Version 3.0** of its **Promis** project management software for the IBM Personal Computer, XT, AT, Personal System/2 and compatible systems.

The software was designed to plan the scheduling, resource management and cost control aspects of a project. Several enhancements have been added since the previous release, including out-of-sequence progress reporting capabilities and dual-scale histograms for side-by-side

Continued on page 54

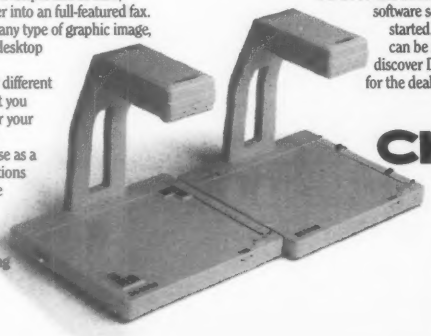


DS-2000 and 3000:
The Affordable Scanners From Chinon.

Chinon's affordable new scanners could change forever the way computers are used. With OCR software you can input text without retyping it. With a simple add-in card, DS-2000/3000 turns your computer into an full-featured fax. And with the ability to scan almost any type of graphic image, DS-2000 and 3000 are perfect for desktop publishing.

Our scanner models offer different levels of scanning resolution so that you can have the scanner that's right for your applications-and your budget. The affordable DS-2000 is perfect for use as a fax or for scanning line art-applications where its 200 dpi resolution is quite adequate, and where speed may be more important. DS-3000, with its 300 dpi resolution, is better suited to OCR applications, or for scanning images for desktop publishing that require grey scale and higher resolution.

DS-2000 and 3000 are sold bundled with exciting software so that it's easy for you to get started. Discover how your computer can be more useful than ever before—discover DS-2000/3000. Call TOLL-FREE for the dealer nearest you.



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Continued from page 52

cost comparisons.

The Time-Scaled Network Diagram in Version 3.0 reportedly will show zones of responsibility for each project manager.

Promis 3.0 costs $2,995.

Strategic Software, 245 First St., Cambridge, Mass. 02142. 617-577-8800.

A budgeting software package developed for the IBM Personal Computer, XT, AT, Personal System/2 and compatibles has begun shipping from **Management Advisory Services, Inc.**

Called **Master Planner**, the product requires Lotus Development Corp.'s 1-2-3 Release 2.01 but reportedly does not require knowledge of the 1-2-3 program. Master Planner creates sales, personnel, inventory, fixed-asset and operating budgets, the vendor said.

The product is recommended for managers responsible for profit and cost centers and for all financial personnel, including accountants, controllers and planning officers.

Master Planner costs $495 for a retail license.

Management Advisory Services, 2401 Fourth Ave., 3rd Floor, Seattle, Wash. 98121. 206-441-0500.

A software program that reportedly lets users visualize their thoughts by creating free-form diagrams on an Apple Computer, Inc. Macintosh system has been announced by **Ceres Software, Inc.**

Called **Inspiration**, the software allows diagrams to be modified and rearranged through the use of symbols, patterns and line thickness.

Using standard editing techniques, topics can be reordered, added, deleted and changed as often as needed. All diagrams can be printed as presentation-quality material.

Inspiration costs $149.

Ceres Software, Suite 103, 9498 S.W. Barbur Blvd., Portland, Ore. 97219. 503-245-9011.

A security program for microcomputers that prevents unauthorized access to data is available from **Software Directions, Inc.**

Called **Softsafe**, the product reportedly provides hard-disk password protection and automatically encrypts data in designated subdirectories. The vendor claims the program also offers virus protection by maintaining a protected copy of critical system files each time the system is booted up. The software runs on IBM Personal Computer, XT, AT, Personal System/2 and compatible machines.

Softsafe costs $99.

Software Directions, 1572 Sussex Tnpk., Randolph, N.J. 07869. 201-584-8466.

Software Directions' *Softsafe*

Micromaps Software, Inc. is shipping **Macatlas Paint Version 2.0**, an expanded collection of maps in Paint file format.

The latest release includes two world maps, 16 maps of world regions defined by country, six maps of the U.S. by state and maps of all U.S. states by county. The maps can reportedly be edited with any Paint program and then pasted into other applications, including page layout and desktop publishing programs.

Macatlas Paint Version 2.0 costs $79. Registered owners may upgrade for $35.

Micromaps, P.O. Box 757, Lambertville, N.J. 08530. 609-397-1611.

Software utilities

Software Trust has announced **Power Tools III**, a package of advanced programming tools designed to work with Ashton-Tate Corp.'s Framework III software.

Power Tools III functions include the ability to automatically filter databases and switch between frames or documents. Pop-up utilities, conversions of numeric values to text and routines for separating address information are also included.

Power Tools III costs $195.

Software Trust, 375 Broadway, Laguna Beach, Calif. 92651. 714-497-3600.

Sunset Software Engineering has updated its **FPAC** and **DPAC** Floating Point Libraries.

For use with most microprocessing systems, the libraries are used in compilers, spreadsheets and embedded applications, the vendor said, and are offered in both single- and double-precision formats.

Several trigonometric functions are available as well as data conversion and floating-point utility procedures.

Code space for the single-precision version is reported to be 3.2K bytes; code space for the double version is 4.4K bytes.

The FPAC and DPAC libraries are available for a one-time fee of $950 and

Mainframe Muscle for your PC

SPF/PC™ 2.0

Now you can re-create the mainframe editing environment on your own IBM PC with SPF/PC, the only PC editor functionally equivalent to editing on the IBM mainframe with ISPF/PDF, Version 2, Release 2.

Files of virtually any size may be edited with SPF/PC because it uses all extended or expanded memory, or disk drive work space.

Mainframe users will especially appreciate SPF/PC's familiar commands, fast PC processing, and micro-to-mainframe file portability.

SPF/PC's main menu provides access to the EDIT and BROWSE facilities; utilities for file MOVE, COPY, RENAME, etc.; facilities to access other programs; on-line HELP and more.

Real work in progress on a COBOL file.

A few other SPF/PC enhancements:

- true split screen
- directory/member lists
- binary file editing
- picture strings
- hexadecimal editing
- 43-line EGA/50-line VGA support

SPF/PC runs under DOS on the IBM PC, XT, AT, PS/2 and all true compatibles; and in DOS emulation under OS/2. Native OS/2 support is in development.

Want proof? Ask us for a **free** interactive, demonstration diskette.

SPF/PC™ — so much like the real thing, you'll forget you're editing on a PC.

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1900 Mountain Boulevard, Oakland, California 94611 Telephone: (415) 339-3530 FAX:(415)339-3883

$1,250, respectively, in absolute format.

Sunset Software Engineering, 14215 N.W. Science Park Drive, Portland, Ore. 97229. 503-644-9676.

A DOS menu shell that is targeted at the corporate personal computer market has been announced by **Lassen Software, Inc.**

Called **Program Manager**, the software allows users to assign each menu item its own Help screen and password. Menus, selections, screens and text can each display the user's choice of individual colors. The memory-resident portion of the program requires 15K bytes, and the software does not use batch files, the vendor said.

Program Manager costs $39.95.

Lassen Software is also offering **Diskette Manager III**, a Microsoft Corp. MS-DOS utility that labels and catalogs disks. The program will reportedly read directories, file names and statistical data from a disk and permit users to assign a 24-char. disk name and up to eight lines of comments. A disk label can then be printed with file names and the user-supplied information.

Diskette Manager III provides three standard label formats for 5¼- and 3½-in. disks, and the package contains 100 labels for each disk size. It costs $59.95.

Lassen Software, P.O. Box 2319, Paradise, Calif. 95967. 800-338-2126.

An assembly language flow-charting and source code analysis tool for Microsoft Corp. MS-DOS programmers has been announced by **Quantum Software.**

Called **ASMFlow**, the program is said to automatically generate flow charts and call tree diagrams from Microsoft's Macro Assembler source files. Other features include stack size determination, CPU timing analysis and procedural cross-reference capabilities.

The product requires DOS 2.1 or higher and 256K bytes of free random-access memory. Extended ASCII support for printers is also recommended.

ASMFlow costs $99.95.

Quantum Software, Suite 154, 19855 Stevens Creek Blvd., Cupertino, Calif. 95014. 408-244-6826.

A product that provides bit-map font capabilities for word processing output functions has been introduced by **Softcraft, Inc.**

Called the **Word Processor Font Solution Pack**, the product includes a type-foundry-quality bit-map typeface library in sizes from 3 to 120 points, the vendor said.

A full-featured graphics font editor is also included for creating special symbols and characters. Utilities for producing special-effects fonts, logos and circular text images are also incorporated.

The Word Processor Font Solution Pack costs $595.

Softcraft, Suite 500, 16 N. Carroll St., Madison, Wis. 53703. 608-257-3300.

A C library designed for advanced program developers has been announced by **Greenleaf Software, Inc.**

Called **Superfunction**, the product offers access to up to 32M bytes of expanded memory using the Lotus/Intel/Microsoft Expanded Memory Specification 4.0 interface, the vendor said.

The software also allows access to high-level DOS functions such as critical error handling, and an advanced set of time and date functions is also included.

The program runs on the IBM Personal Computer, XT, AT, Personal System/2 and compatible systems and requires DOS 2.0 or higher.

Superfunction costs $265, which includes full documentation, demonstration programs and source code.

Greenleaf Software, Suite 570, Bent Tree Tower Two, 16479 Dallas Pkwy., Dallas, Texas 75248. 214-248-2561.

Macintosh products

Letraset USA has released an enhanced version of **Ready, Set, Go**, its page layout software program for Apple Computer, Inc. Macintosh systems.

Version 4.5 reportedly includes fractional point sizes down to one hundredth of a point, user-controllable kerning and tracking. Letterspacing precise to the one-thousandth of an em space has also been added, the vendor said.

Customers who purchased Version 4.0 before July 5 will receive the upgrade free of charge. Other 4.0 users will be charged $49.95, and owners of versions prior to 4.0 may order the upgrade for $85.

The company has also announced an upgrade to its **Imagestudio** package. **Version 1.5** of the image enhancement software is said to include a virtual-memory management system that lets the user maximize available memory for individual system configurations. Settings may be saved as the default.

The software also supports gray-scale editing of 256 gray-level files at resolutions ranging from 10 to 2,000 dot/in.

Version 1.5 will be available free of charge to registered users and will retail for $495.

Letraset, 40 Eisenhower Drive, Paramus, N.J. 07653. 201-845-6100.

Kurta Corp. has introduced intelligent graphics tablets that were designed for use with Apple Computer, Inc. Macintosh II and Macintosh SE computers.

Called the **IS/ADB** input systems, the three programmable tablets reportedly enable Macintosh users to move screen cursors and draw, sketch and trace more accurately than is possible with a mouse.

The tablets can also execute user-pro-

Continued on page 56

BOOTH 470
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"SUPERSTRUCTURE's™ *improvements just made the best Cobol structuring product even better.*"

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Continued from page 55

grammed command sequences, and the units plug directly into the Apple Desktop bus. The three available sizes are an 8½-by 11-in. model that costs $395, a 12- by 12-in. model priced at $595 and the 12- by 17-in. version, which costs $965.

Kurta, P.O. Box 60250, Phoenix, Ariz. 85082. 602-276-5533.

Avalon Development Group in Cambridge, Mass., has announced color photo-design software that runs on the Apple Computer, Inc. Macintosh II.

Called **Photomac**, the product was reportedly developed to bring color image processing and separations to in-house graphics design and publishing groups. The software allows users to manipulate, retouch and correct color images, the vendor said, as well as print color proofs and generate four-color separations for printing. Images can also be combined with text in page-layout software.

Photomac costs $695 and is scheduled to be available in November.

The product will be distributed through Data Translation, Inc., 100 Locke Drive, Marlboro, Mass. 01752. 508-481-3700.

A 3½-in. form-factor hard-disk storage subsystem for the Macintosh II has been announced by **Dolphin Systems Technology.**

Called the **AM80-III**, the product fits into the position allotted for a second floppy drive in the Macintosh II. The disk has a formatted capacity of 80M bytes and an average access time of 19 msec, the vendor said.

AM80-III *stores 80M bytes*

The product combines with the 40M-byte hard disk that is standard on the Macintosh II to raise total available disk storage to 120M bytes.

The AM80-III costs $1,995. All necessary mounting hardware is included.

Dolphin, 603-B E. Alton Ave., Santa Ana, Calif. 92705. 714-546-6938.

AST Research, Inc. has unveiled an 8-, 16- or 24-bit color image capture card for Apple Computer, Inc. Macintosh II computers.

Called **Nuview**, the card will digitize and manipulate real-world, real-time images from any national television standard code or red-green-blue source, such as a video camera or video cassette recorder, according to the vendor.

The single-slot enhancement board captures 8-, 16- and 24-bit color and black-and-white images from the external video source and displays the images at a resolution of up to 640 by 480 pixels via any Apple-compatible video display card, the company said.

Other features include panning, zooming, clipping and masking, and the product is supplied with AST's Review image processing software for providing image analysis and enhancement.

Nuview costs $2,099, which includes Review and a two-year warranty.

AST Research, 2121 Alton Ave., Irvine, Calif. 92714. 714-863-9991.

An LCD projector developed for use with the Apple Computer, Inc. Macintosh II machine is now available from **Nutmeg Systems, Inc.**

The **Nutmeg/Kodak Datashow**, which also works with the Macintosh SE and Mac Plus, reportedly combines the company's proprietary interface with Eastman Kodak Co.'s Datashow HR/M projection pad to work with standard overhead projectors.

Designed for classrooms, meeting rooms and other large presentation situations, the product offers a 72 dot/in. resolution in a 512- by 342-pixel display to replicate the Macintosh screen.

The Nutmeg/Kodak Datashow costs $1,695 for use with the Macintosh Plus and SE systems and is priced at $1,995 for the Macintosh II configuration.

Nutmeg Systems, 25 South Ave., New Canaan, Conn. 06840. 203-966-3226.

Development tools

A software tool that allows developers to port code from DOS to OS/2 and back again has been announced by **Solution Systems.**

Called the **C-Worthy Interface Library for OS/2**, the package is said to be compatible with Microsoft Corp.'s Microsoft C Version 5.1. The system will create and manage an entire user interface including on-line Help, errors, screen display and data input, the vendor said.

Source code is available for both the DOS and OS/2 versions.

C-Worthy Interface Library for OS/2 costs from $195.

Solution Systems, Suite 410, 541 Main St., S. Weymouth, Mass. 800-821-2492.

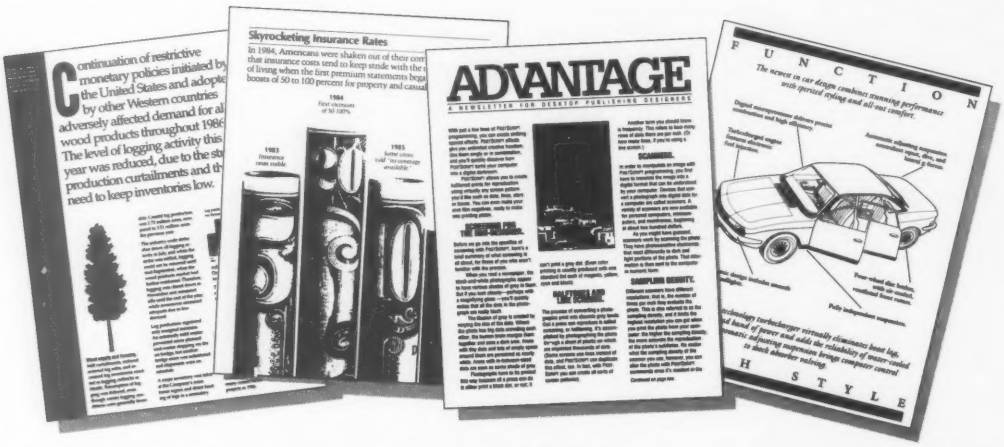
Informix Software, Inc. has announced that the **Informix-4GL Rapid Development System and Interactive Debugger** is now available for the Microsoft Corp. MS-DOS operating system.

The system will provide MS-DOS programmers with an environment suitable for developing and simultaneously debugging SQL-based database applications, the vendor said.

The product reportedly reduces application development time by eliminating the need for a C compiler. Fourth-generation language code is quickly compiled into a pseudocode (p-code), which is run by a p-code runner included in the software. The product will run on Intel Corp.'s 8086-, 80286- and 80386-based machines.

Informix-4GL Rapid Development System and Interactive Debugger costs $1,495 for the

Freedom of Press.



Over the last few years, Adobe Systems has brought forth some very revolutionary ideas.

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DOS release.

Informix Systems, 4100 Bohannon Drive, Menlo Park, Calif. 94025. 415-322-4100.

Optima, Inc. has announced a computer-aided software engineering tool that operates under the Microsoft Corp. Windows environment with full-color graphics, the vendor claims.

Called **Designvision**, the product allows the systems developer to select a standard modeling technique or create an original diagraming model.

Diagram components can be rearranged to display the outcome of various project implementation steps on the screen. The product can display diagrams in both overview and detailed formats.

Designvision costs $7,500 per single copy and runs on any personal computer-based workstation with 640K bytes or more memory.

Optima, Suite 400, 1300 Woodfield Road, Schaumburg, Ill. 60173. 800-633-6303.

Cadkey, Inc. has recently enhanced its computer-aided design and drafting package, **Cadkey 3**.

Several new features have been incorporated into the system, including construction planes, an on-line text editor and a full three-dimensional box mode that allows the user to surround 3-D data with a "rubber box" and translate these objects to a new X, Y and Z position.

Graphics card support has been extended to include a wider variety of vendors, and the entity list that makes up Cadkey's basic construction methods now includes conics.

The latest version of Cadkey 3 costs $3,195.

Cadkey, 27 Hartford Tnpk., Vernon, Conn. 06066. 203-647-0220.

Cadware has introduced software that enables users to structure their own computer-aided software engineering (CASE) environments.

Called **Sylva Foundry MS-DOS**, the product is an IBM Personal Computer-based workbench that contains tools for technique creation, technique modification and an open-architecture interface for other tools, the company said.

The product automates the creation of modeling objects and the local and global rules that govern them. A diagram editor provides rule-based drawing capability through an intuitive interface.

Sylva Foundry MS-DOS is priced at $8,500.

Cadware, 869 Whalley Ave., New Haven, Conn. 06515. 800-223-9273.

Phar Lap Software, Inc. has updated its software development tool kit for Intel Corp. 80386-based systems.

Version 2.0 of 386/ASM/Link reportedly includes an 80386 assembler, linker and debugger.

The product is designed to be used with 386/DOS-Extender, a proprietary protected-mode runtime system, according to Phar Lap.

Additional features include the ability to call real-mode functions such as graphics libraries from protected mode.

The vendor claims that the linker facility in Version 2.0 is 30% faster than the previous release.

The update cost for Version 2.0 of 386/ASM/Link will be $125. The retail price for 386/ASM/Link is $495.

Phar Lap Software, 60 Aberdeen Ave., Cambridge, Mass. 02138. 617-661-1510.

A language tool kit that allows SQL from Ashton-Tate Corp. Dbase III/Plus languages to be embedded in software application products is now offered by **Abraxas Software, Inc.**

The kit reportedly runs in conjunction with the company's PCYACC and MACYACC, which generate source code for query languages for Apple Computer, Inc. Macintosh and IBM Personal Computer software.

PCYACC generates ANSI C source code for Microsoft Corp., Borland International and Lattice Software, Inc. compilers; MACYACC for Think Technologies' Lightspeed and Manx Software Systems, Inc. Aztec C compilers.

Both retail for $395.

Abraxas Software, 7033 S.W. Macadam Ave., Portland, Ore. 97219. 503-244-5253.

Data storage

Irwin Magnetic Systems, Inc. has announced the **Accutrak** family of precision, factory-formatted data cartridges for use with the company's mini-cartridge tape backup systems.

Each formatted cartridge is said to have servo signals periodically embedded along the entire length of each tape track to aid in keeping the read/write head of the tape drive centered over the track.

According to the vendor, the products are especially suited for exchanging large volumes of data between Irwin-equipped Apple Computer, Inc. Macintoshes, IBM Personal Computers, Personal System/2s and compatible systems.

The Accutrak DC 2000 ¼-in. tape cartridge costs $35. The DC 1000 0.15-in. cartridge is $30.

Irwin Magnetic Systems, 2101 Commonwealth Blvd., Ann Arbor, Mich. 48105. 313-996-3300.

Accutraks *are preformatted*

Priam Corp. is now shipping 5¼-in. optical write once read many storage systems designed for IBM Personal Computer ATs and compatible Intel Corp. 80286- and 80386-based PCs.

The **IW115** and the **EW115** are internal and external units,

Continued on page 58

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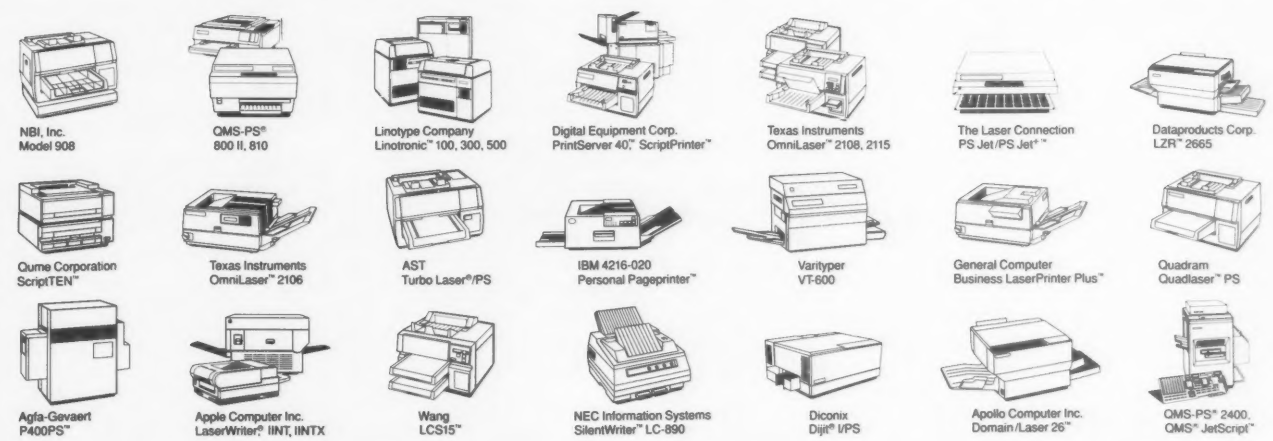

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Continued from page 57

respectively, and offer a reported 115M bytes of storage per side. The optical storage kits are especially suited to legal, medical and financial environments. According to the company, applications include storage of files and contracts, patient records, x-rays, credit histories, signature files and photographic images.

Both internal and external versions are available with a controller.

The IW115 costs $2,695, and the EW115 is available for $2,945.

Priam Corp., 20 W. Montague Expwy., San Jose, Calif. 95134. 408-434-9300.

Flexstar Corp., a peripheral test systems maker, has released **Version 4.0** configuration software for its FS540 Plus Advanced Disk Drive Simulator.

The FS540 is a stand-alone unit that can be controlled by an IBM Personal Computer, XT, AT or equivalent host microcomputer for test, correlation and characterization of disk drive and controller products.

Features include the ability to view raw track buffer data and write splice detection.

Version 4.0 costs $995.

Flexstar, 606 Valley Way, Milpitas, Calif. 95035. 408-946-1445.

Microscience International Corp. has entered the 3½-in. Winchester disk drive market with the **4050** through **7100** series of drives, designed for total system performance, the company said.

The units are aimed at users and manufacturers of IBM Personal Computer ATs and Intel Corp. 80286-based AT clones, 80386-based machines and IBM Personal System/2s.

The drives have a reported average access time of less than 18 msec, a track-to-track speed of 4 msec with zero latency read and data transfer rates up to 10M bit/sec. The products offer formatted capacities of 44M to 110M bytes.

Prices range from $475 to $825 in OEM quantities and cost $625 to $1,295 retail.

The units are scheduled to be available in the third quarter.

Microscience International, 305 N. Mathilda Ave., Sunnyvale, Calif. 94086. 408-730-5965.

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Peripherals

AT&T has added three line printers to its existing product offerings. All three work with a variety of computers and peripherals including AT&T's 3B line, the 6500 Multifunction Communication System, the 4540 and E4540 systems and the Workgroup System. The printers also work in conjunction with AT&T's System 75 and System 85 public branch exchanges and AT&T central office switches linked to 3B computers.

The 442 Line Printer is a pedestal model that reportedly operates at a sound level of less than 68 db. The **444 Line Printer** can be field-upgraded from a maximum speed of 400 to 650 line/min.

Both the 444 and 446 printers come with acoustics cabinets said to maintain sound levels of 55 db.

Standard features on all three models include fully formed character band printing, six-part print form capabilities, 16-digit LCD displays and bidirectional paper motion.

The printers cost from $7,225 to $13,990, depending on printer and options selected.

AT&T Data Systems Group, 1 Speedwell Ave., Morristown, N.J. 07960. 800-247-1212.

Wyse Technology has announced a series of monitors designed to be compatible with IBM's Personal System/2 Video Graphics Array (VGA) standard.

The **WY-550** monochrome monitor has a 14-in. diagonal display and a choice of paper-white or amber phosphor. The **WY-650** color monitor is reported to be a fully IBM-compatible 12-in. display with 0.28mm-dot pitch and can simultaneously display up to 256 colors. It has a text switch to provide a monochrome mode for focused character resolution.

Both monitors feature a horizontal scan frequency of 31.5 kHz, a vertical scan frequency of 50, 60 or 70Hz and a 640- by 480-pixel resolution. When combined with the WY-450 VGA adapter card, the displays reportedly offer full compatibility with IBM Personal Computers and Personal System/2 machines.

The WY-550 costs $249; the WY-650 costs $629.

Wyse Technology, 3571 N. First St., San Jose, Calif. 95134. 408-433-1000.

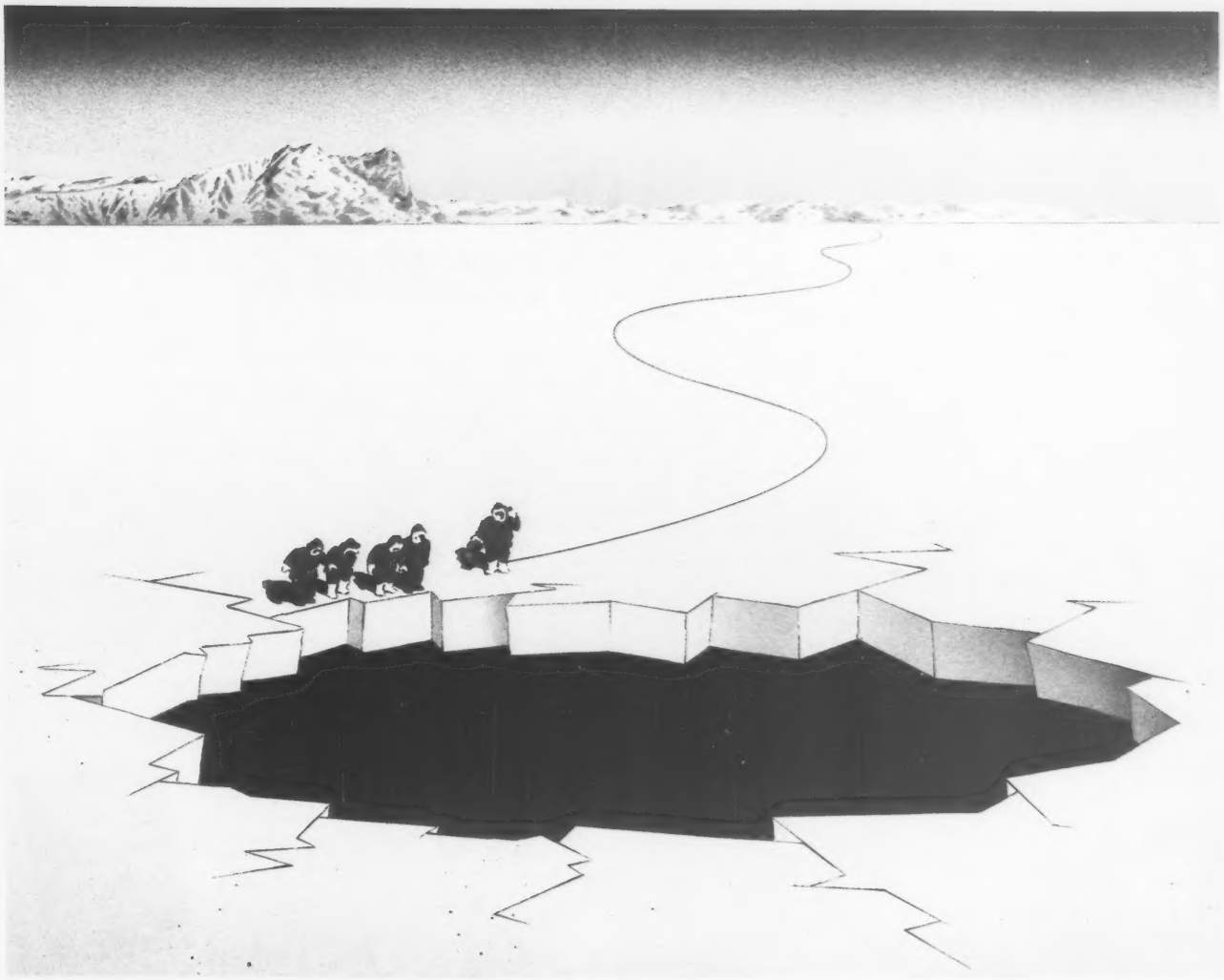
Toshiba America, Inc.'s Information Systems Division has expanded its line of printer products with a 24-pin color printer, the **P321SLC**, and a **color upgrade option** for its P351SX 24-pin printer.

The P321SLC reportedly prints seven colors and was designed for use in small to medium-size businesses or as a departmental unit. The product includes built-in paper-handling accessories and is said to print at 216 char./sec. in high-speed draft mode and 72 char./sec. in letter-quality mode. The printer costs $949.

The P351SX's wide-carriage unit reportedly features 360 by 360 dot/in. graphics capability. The device prints at 360 char./sec. in high-speed draft mode and offers 120 char./sec. in letter-quality format. The upgrade kit enables users to install seven-color capability.

The P321SLC costs $1,599, and the upgrade kit is available for $239.

Toshiba America Information Systems Division, 9740 Irvine Blvd., Irvine, Calif. 92718. 714-583-3000.



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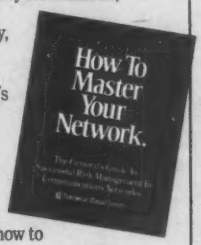

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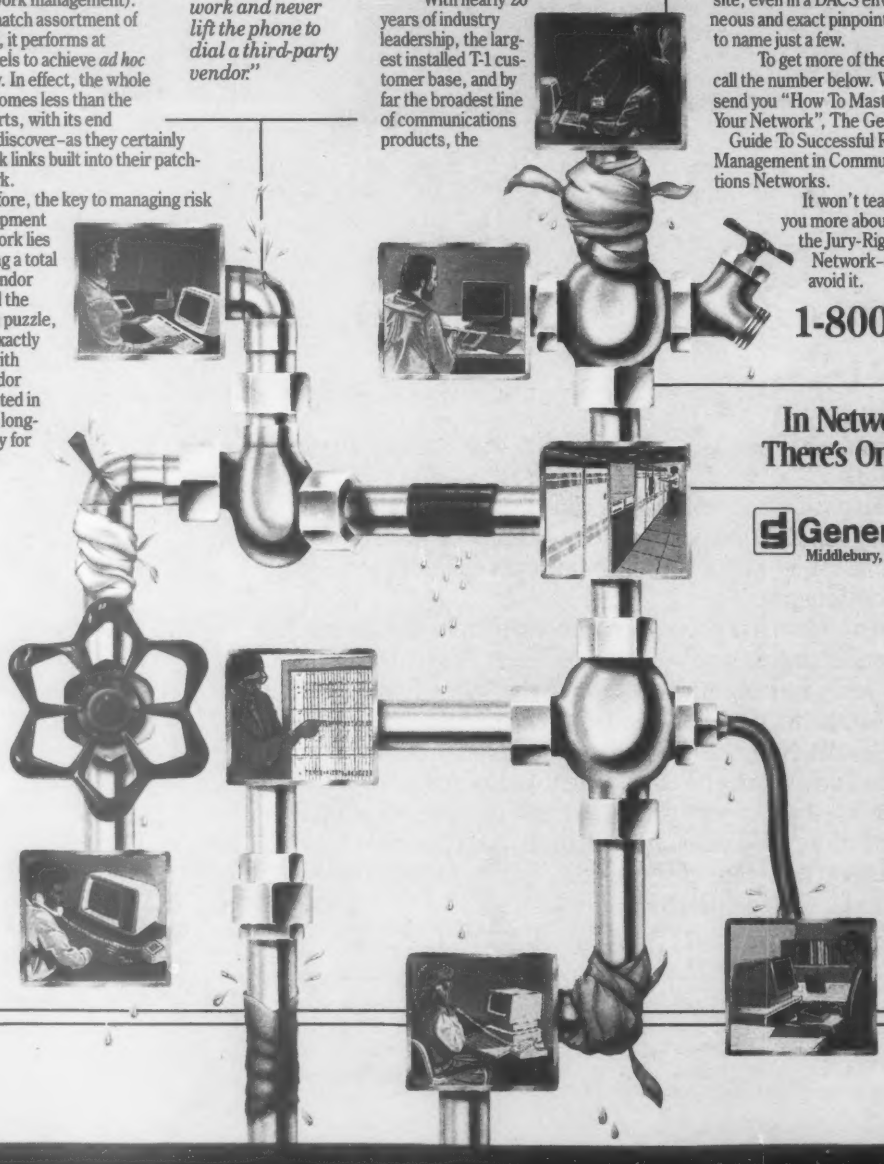
1-800-777-4005



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Personal Computer Products, Inc. has added three laser printers to its existing Laserimage series and has also announced a page description language for desktop publishing applications.

The **Laserimage 1000-IS, 2000-IS** and **3000-IS** are 6, 8 and 15 page/min. printers, respectively. The 1000-IS is priced at $4,695. Designed for a workstation and office environment, the 2000-IS carries a retail price of $4,695, and the 3000-IS is said to be suited for the printing needs of large computer systems, high-volume workstations and corporate networks. It costs $7,695.

All three printers can be used with the Imagescript cartridge.

Imagescript was specifically designed for users of the Laserimage series of laser printers. The product is an emulation of Adobe Systems, Inc. Postscript and reportedly enables users to create scale fonts, rotate text and graphics and command other printing functions.

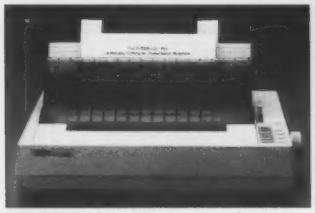
The Imagescript cartridge costs $995.

Personal Computer Products, 11590 W. Bernardo Court, San Diego, Calif. 619-485-8411.

Epson America, Inc. has extended its dot matrix printer line with the addition of several products.

The company's announcements include the **DFX-5000**, a 9-pin serial dot matrix printer with dual paper paths designed to accommodate a variety of applications. The product incorporates a paper sensor that will automatically adjust the printer head to accommodate different thicknesses of multipart forms, the vendor said. The wide-carriage printer costs $2,199.

The **LQ-950** is a 24-pin, letter-quality model designed with multiple paper-handling control functions and enhanced desktop presentation capabilities. Output is delivered in a 110-col format, and print speeds are said to be 264 char./sec. in draft mode and 88 char./sec. in letter-quality mode. The unit is available for $949.



LQ-950 *prints 264 char./sec. in draft*

The **LQ-2550** 24-pin printer is reportedly equipped with a front control panel that allows users to access several built-in functions, including draft and letter-quality print speeds, seven resident letter-quality fonts, 360 by 360 dot/in. resolution and color printing capabilities.

Print speeds are reportedly 400 char./sec. in draft mode and 133 char./sec. in letter-quality mode. The product costs $1,499.

Epson America, 2780 Lomita Blvd., Torrance, Calif. 90505. 800-922-8911.

Microtouch Systems, Inc. has started shipping its **ADB Mac 'n Touch Screen** for Apple Computer, Inc. Macintosh SE and Mac II computers. The SE kit now costs $695, a reported 45% reduction over a similarly configured serial version that was previously offered by the company.

The touch screen is compatible with the Apple Desktop Bus and works with Hypercard and all Macintosh software, the vendor said. The product comes with driver software, a controller card and a 9-in. glass sensor for the Macintosh SE.

A range of sensors is also available for the Mac II, including a 14-in. diagonal screen for the Apple Color High Resolution red-green-blue monitor and a 19-in. display for other large screens.

Microtouch Systems, Ten State St., Woburn, Mass. 01801. 617-935-0080.

Board-level devices

Supermac Technology Co., a division of Scientific Micro Systems, Inc., is now shipping a plug-in accelerator for the Apple Computer, Inc. Macintosh SE.

Called **Speedcard**, the product reportedly doubles the speed of the Macintosh SE via a 16-MHz Motorola, Inc. 68000 processor and a 16K-byte hardware random-access memory cache mounted on a plug-in card.

An optional 16-MHz 68881 math processor is also available, and an on-board expansion port is provided for attaching Mac SE cards internally.

The Speedcard costs $399.

Supermac Technology, 295 N. Bernardo Ave., Mountain View, Calif. 94043. 415-962-2490.

Three data-acquisition interfaces for the IBM Micro Channel Architecture (MCA) Personal System/2 series are now available from **National Instruments Corp.**

The **MC-MIO-16**, **MC-DIO-24** and **MC-DIO-32F** MCA interface boards reportedly offer analog-to-digital conversion, timing I/O and digital I/O. The plug-in boards are compatible with the PS/2 Models 50, 60 and 80.

The MC-MIO-16 comes in three speed configurations. The digital I/O boards, the MC-DIO-24 and the MC-DIO-32F, can be used with the PS/2 as controllers in laboratory and production testing and industrial process monitoring and control.

The interfaces cost from $245 to $1,195, depending on configuration.

National Instruments, 12109 Technology Blvd., Austin, Texas 78727-6204. 800-4333-488 (Texas); 800-531-4742 (outside Texas).

TI's OmniLaser 2106. The laser printer for today, tomorrow, and when there is no tomorrow.

When your success depends on making great-looking documents, you need a laser printer that's versatile enough to handle just about anything that comes up. That printer is Texas Instruments OmniLaser™ 2106.

This quiet, six-page-per-minute laser printer comes with all the capabilities you need to produce word processing, spreadsheets and other PC applications. It also comes standard with Adobe™ PostScript®, the magic behind desktop publishing. So you get unsurpassed control over type, graphics and page composition. All from the top of your desk.

Beyond word processing.

Today, people in every pursuit are changing to desktop publishing to give their documents an edge. With over 600 software packages supporting PostScript, TI's OmniLaser 2106 gives you the power to print today's documents and then go far beyond. Because not only does the OmniLaser emulate the HP LaserJet Plus™, it also features Adobe PostScript. So your documents look better, communicate faster and sell harder.

TI's OmniLaser 2106 with PostScript gives you excellent control over type, graphics and page composition.

Improve your standard of printing.

TI's OmniLaser 2106 gives you great graphics, text that looks typeset and paper handling features that allow you to print on envelopes, legal size and more. It also features multiple industry-standard emulations and interfaces. All easily selectable at the touch of a button.

TI's OmniLaser 2106. It's the laser printer of your future, as well as the one you need right away. The OmniLaser family also includes the 2108 small-cluster printer and the 2115 shared-resource printer. For a free brochure on how to choose a laser printer and information about TI's on-site warranty, call 1-800-527-3500.

TEXAS INSTRUMENTS

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PC graphics flourishing

Lotus, Micrografx, Adobe add products to market lineup

BY DOUGLAS BARNEY
CW STAFF

The personal computer graphics market has been heating up with a rash of new products from leading vendors, including Lotus Development Corp., Micrografx, Inc. and Adobe Systems, Inc.

Lotus has kicked off the charge with Freelance Plus 3.0, an enhanced version of its popular graphics program. The $495 package, which includes both charting and drawing, adds the Portfolio feature for creating presentations. Portfolio leads users through the tedious process of developing presentations and has the ability to create black-and-white handouts. Freelance supports scanned images and a wider range of file types and reportedly provides greater ease of use. It is slated to ship in December.

Micrografx has announced two versions of its Microsoft Corp. Windows-based software. The $395 Draw Plus, a free-form graphics program, now includes context-sensitive help, can import bit-map images and can connect and fill irregular objects. Draw Plus uses Windows' full complement of icons and pull-down menus.

Adobe, broadly known for the Postscript page-description language, has ported its illustration package from Apple Computer, Inc.'s Macintosh to the IBM Personal Computer. Adobe Illustrator, Windows Version, will butt heads with Micrografx's Designer, an illustration package with drafting and technical illustration capabilities.

The $695 Adobe Illustrator requires a full megabyte of random-access memory, a hard disk drive and high-resolution graphics. In return, users gain the ability to do freehand drawing, copy and paste, zoom and output their work to a Postscript or compatible printer.

Timeline net has users ganging up

CUPERTINO, Calif. — The 140,000 users of Symantec Corp.'s Timeline can now share their data — at least, small groups of them can — thanks to a network version of the project management system.

"The new version allows Timeline to run from a file server. Multiple users can view a Timeline schedule, but only one can edit the schedule," explained Rod Turner, vice-president of Symantec.

In addition to providing multiuser access to schedules, the package can save an organization's overall use of hard-disk space and save money, to boot, according to the manufacturer.

The software reportedly runs on IBM Personal Computers and compatibles and on all networks compatible with Microsoft Corp.'s MS-DOS 3.1.

For a single copy, Timeline carries a price tag of $595. Each additional node is priced at $195.

As with most packages, these prices are subject to the standard discounts, and they should end up costing users considerably less. The product is currently available.

Dest scanner picks up on characters

SANTA CLARA, Calif. — End users who frequently enter large volumes of text into page-layout programs know how time-consuming and sometimes difficult a task it can be. Dest Corp.'s Workless Station II, a high-end multifunction scanner, promises to make the job easier.

The Workless Station II offers a combination of connectivity options, applications interfaces and sophisticated text-recognition and image-input capabilities, according to the company.

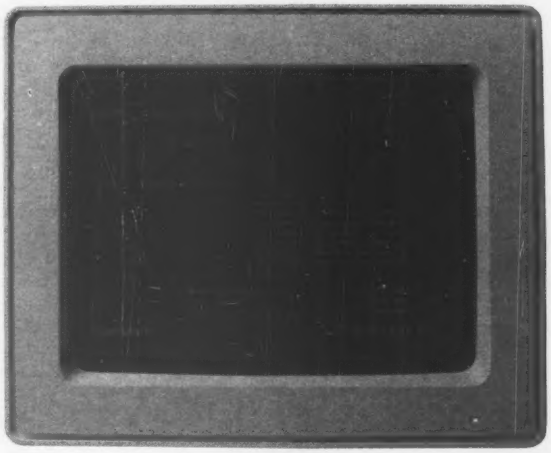
The device reads a variety of text output from phototypesetters, typewriters and dot-matrix, daisywheel and laser printers, Dest said. It also features a range of customer interface options for dedicated word processors, personal computers, minicomputers and phototypesetters. The Workless Station features image-scanning resolution of 300 dot/in. and 8-bit gray-scale input of 256 levels of image data, according to Dest.

Three optical-character recognition techniques work together to enable the system to read a broad array of type styles with considerable accuracy and speed.

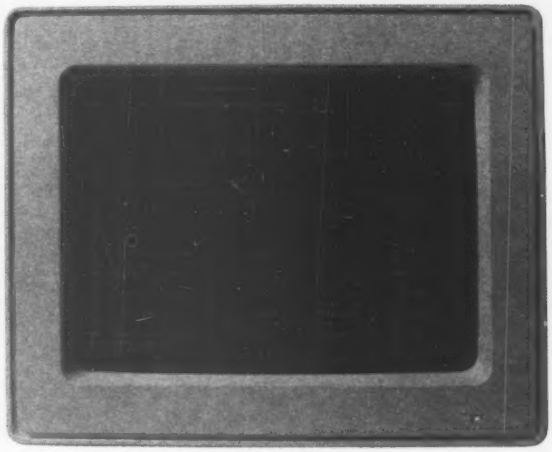
Type sizes from eight to 18 points printed in plain and bold formats can be read at a speed of approximately 60 char./sec., the company said.

The Workless Station II, which is available now, has a suggested selling price of $9,795.

What you've been doing.



On your 286,
you've been making any task look complicated.



On your 386,
it hasn't been incredibly exciting having all that power.

If the screens on the right look more intriguing to you than those on the left, you're ready for Microsoft® Windows.

Windows opens up the world of visual thinking to all 286 and 386 owners by offering the power of graphics.

Everything you can do on your PC, you can now do better, faster and with greater imagination. Whether you're creating documents or trying to get a clearer picture of your work.

What used to take complicated keystrokes can now be accomplished with the simple click of a mouse. With Microsoft Windows, you access pull-down menus. Simultaneously work with different programs as well as cut and paste between them to create graphic examples within different bodies of text. And what you see on the screen will appear on your printed page.

And once you've learned Microsoft Windows, you'll have the basis for scores of other programs because all the countless new Windows applications are based on the same easy, logical format.

Since Microsoft Windows virtually looks and works like MS® OS/2 Presentation Manager, you won't have to worry about it becoming obsolete in a couple years. We made both systems compatible. So, in the future, you'll be able to share data between them. And your knowledge of Windows will give you a jump on learning MS OS/2 Presentation Manager.

Stop playing with ancient instruments. Now cutting and pasting is a simple point and click with the Microsoft Mouse.

You'd expect a program this powerful to require a more powerful machine. But we consistently create software that makes

©Copyright 1988, Microsoft Corporation. All rights reserved. Microsoft, the Microsoft logo and MS are registered trademarks, and Making it all make sense is a trademark of Microsoft Corporation. The following products have been used courtesy of their respective developers: Lotus and 1-2-3 by Lotus Development Corporation; WordPerfect by WordPerfect Corporation; PageMaker by Aldus

Lack of simple software retards spread of Unix in workstation area

BY JULIE PITTA
CW STAFF

SANTA CLARA, Calif. — Although Unix is gaining ground in many small group- and workstation-oriented arenas, industry analysts said at a recent Seybold Desktop Publishing Conference that it will be some time before it becomes widely accepted for desktop publishing.

The main obstacle limiting its use in the field is the shortage of easy-to-use software that already exists in the worlds of Microsoft Corp. MS-DOS and Apple Computer, Inc.'s Macintosh, said Tim Bajarin, vice-president of Creative Strategies Research International, a Santa Clara, Calif., market research firm.

"If you're doing high-performance topography and composition, you need a high-performance tool," said Rick Young, industry analyst at San Jose, Calif., market research firm Dataquest, Inc.

Pricing has steered users to MS-DOS-based systems or Macintosh personal computers. Unix-based workstations have been too pricey for the average user and are mostly found in technical environments where their power is needed for design purposes.

However, the advent of Xenix-based PCs and Sun Microsystems, Inc.'s introduction of lower-priced Unix-based workstations — particularly its 386I — offer users a relatively inexpensive Unix alternative to PCs.

Bajarin said Unix will grow in popularity, given its multitasking capability. "The power of Unix will take desktop publishing far beyond what we know today," he said.

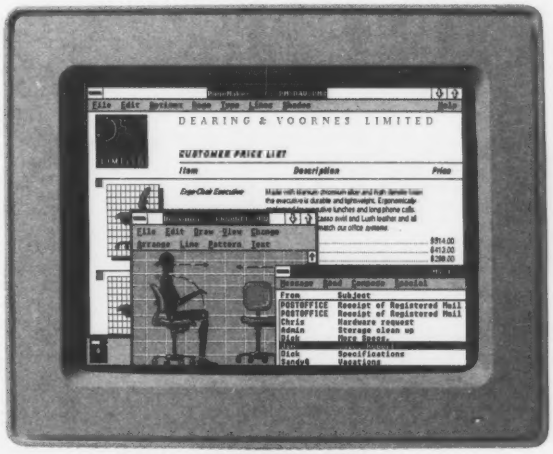
In other Seybold happenings, Adobe Systems, Inc. introduced Adobe Font Folio, a 45M-byte hard disk drive that contains more than 300 typefaces. The Adobe Font Folio is priced at $9,600 and is scheduled for shipment next month. It was designed for use with the Macintosh Plus, SE and II.

Additionally, Adobe debuted Adobe Illustrator, Windows Version, for the IBM Personal Computer. It is priced at $695 and is slated to ship by year's end.

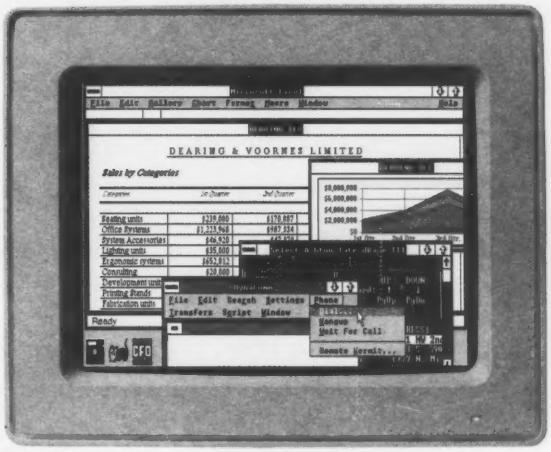
Wyse Technology introduced a 19-in. monochrome display subsystem for use in desktop publishing. It is compatible with IBM Color Graphics Adapter and Video Graphics Array and Hercules Computer Technology, Inc. color graphics. It features a 1,280- by 960-pixel display with an intelligent controller based on the Texas Instruments, Inc. 34010 graphics processor. The WY-7190 is priced at $2,195 and reportedly will ship next month.

> "THE POWER of Unix will take desktop publishing far beyond what we know today."
>
> TIM BAJARIN
> CREATIVE STRATEGIES

What you could have been doing.



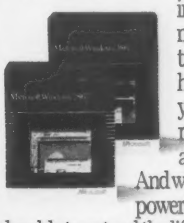
With Windows/286, you could have been seeing things much more clearly.



With Windows/386, you could have been seeing a lot more things much more clearly.

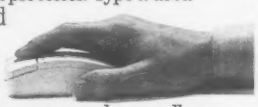
the best use of your present hardware.

For example, Microsoft Windows/286 will work with as little as 640K and instantly make your machine more sensitive, intuitive and highly visual. It gives you the ability to run every Windows application available. And with access to all those powerful programs, you'll be able to extend the life and usefulness of your 286 well beyond the introduction of MS OS/2 Presentation Manager. With version 2.1 you also get the benefit of increased speed. So you'll blaze through Windows applications up to 87% faster.



Microsoft Windows/386 will give you everything that Windows/286 gives you. Plus multitasking with most DOS applications. Now you can finally utilize the speed and power of any 386 machine.

Imagine creating a complicated spreadsheet. Then while a macro is being run, open up a word processor. Type a document, open and work with a graphics program. Cut and paste between programs and even call up electronic mail. And still be able to check on the status of your spreadsheet at any time.



Considering all you can do with Microsoft Windows, you have only one question to ask yourself.

What have you been doing without it?

Microsoft®

Corporation; dBASE III PLUS by Ashton-Tate Corporation; Network Courier by Consumers Software, Incorporated; Micrografx by Micrografx, Incorporated; PackRat by Polaris Software; and CFO Advisor by Financial Feasibilities, Incorporated. PackRat is a trademark of Polaris Software. CFO Advisor is a trademark of Financial Feasibilities, Incorporated.

Traders view colorful world from Windows

Stockbrokers who stare at dull, character-oriented terminals may soon see a brighter future.

Quotron Systems, Inc., a leader in stock price information, has a new system that operates under Microsoft Corp.'s Windows, allowing traders to monitor real-time stock quotes and chart them simultaneously. Unlike the staid screen that traders are used to, this system uses full-color icons and pull-down menus.

Many other trading organizations, including Reuters Ltd., have moved to the Windows environment because it provides ease of use, multiple windows and Microsoft's Dynamic Data Exchange, which is handy for feeding personal computers real-time data.

The initial market for the product is small, with sales going largely to Quotron sites with PCs, company officials admitted. The market, however, is expected to grow as more traders move up to high-end PCs capable of running Windows.

Quotron will market three separate Windows packages, including Quotdata for real-time stock data, Quotchart for analyzing and charting and Quotterm for terminal emulation. Quotron will also bundle the systems with Microsoft's Excel spreadsheet for data analysis.

The Excel bundling deal would not prevent Quotron from reaching a similar deal with spreadsheet leader Lotus Development Corp., but Quotron is still waiting for a version of 1-2-3 that can work effectively with real-time stock data.

Prices begin at $500, and the products are available now. An IBM or compatible PC with 640K bytes of random-access memory, a hard disk, a serial port and IBM's Enhanced Graphics Adapter are required. Users must also subscribe to the Quotron 1000 stock price service.

What should every company demand from a computer system?

Growth.

Introducing the IBM Application System/400.

When your business is small, you can buy an IBM® Application System/400,™ and it will be just the right size.

Later on, you'll still be smiling.

That's because as your company grows, your Application System/400 can grow right along with you. And the investments you made at first–in software, training, and peripherals–will still be working for you.

That's what the IBM Application System/400 is all about. It comes from IBM's leadership with over a quarter million mid-size computer systems in place, and it does what growing companies have told us they want.

It lets you grow into what you need, without outgrowing what you've paid for.

Today: Solutions for your business, from the leader in business solutions.

Never before has a mid-size computer system been introduced with so much proven software

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ready to go. Thousands of programs that run on IBM's System/36 and /38 can run on the IBM Application System/400.

Even better, any program you start with, you can stay with. No matter how big your Application System/400 gets, your software will always work.

Tomorrow: Protection for your investment as your business grows.

Most models of the IBM Application System/400 come rack-mounted like a stereo system. Components slide in and out, so you can upgrade right on the spot. You're not locked into any particular setup. Your system's only as big as you need, and making it bigger is easy.

What's more, the Application System/400 comes with a state-of-the-art education system, plus customer support that's unmatched in the industry.

For a free brochure, or to arrange for a detailed discussion about the Application System/400, call 1-800-IBM-2468, ext. 82.

IBM The Bigger Picture

Barney

FROM PAGE 45

task, they are often telling printers and modems and screens what to do all at the same time. So just like your favorite nincompoop who chews gum and walks only to fall on his face, these buses just can't handle it.

But with MCA, the interrupts are handled in levels so that they don't conflict with each other and give the whole ball of wax a major meltdown.

It seems that the cloners have figured this out because their proposed bus, Extended Industry Standard Architecture, will use level-sensitive interrupts. I'm sure glad *they* thought of it.

Speaking of EISA . . . Little more than two years ago, many were wondering how Compaq was going to make it. Most personal computers were finally compatible and getting cheaper all the time. Compaq's were compatible but still cost more. Analysts thought Compaq was about to get creamed.

But then came the Yuppie strategy. The firm came out with a fancy Intel 80386-based box and became the Porsche of the PC set. A lot of the performance came from the chip itself, and some came from high-speed random-access memory. But to keep ahead, Compaq played with the bus and came up with a multiple-bus approach called Flex/Architecture.

Now Compaq has agreed with the rest of the clone community that the 32-bit way is cool and that everyone should have the very same 32-bit foundation. Compaq can still differentiate on top of this bus, but since the bus itself is higher performance, this differentiation should have less impact. So what will Compaq do next to show up its competitors? We have no idea, but knowing Compaq, it'll think of something.

The Lowe Letter. The press and analyst community has not been nice to IBM's Bill Lowe. In fact, they have been sardonically waiting for the ax to fall. Well, it hasn't fallen yet. Lowe is still the president of IBM's Entry Systems Division and is still calling a lot of IBM's PC shots.

Many figured that Lowe was outski because he was passed over for promotion (if that was the case, we'd all be out of work) and because IBM's market share has fallen. We were a bit suspicious because Lowe has been resilient, the MCA was bound to be a tough sell and Lowe hadn't been given the boot.

Those comments seemed to be nothing more than a Lowe blow.

Lowe probably hasn't been too happy with outsiders predicting his fate, and IBM has decided to fight back. Highly personalized letters were sent to various offending publications (we didn't get one) such as *The Wall Street Journal* and *USA Today* that essentially said, "Call off the dogs, Lowe's doing just fine."

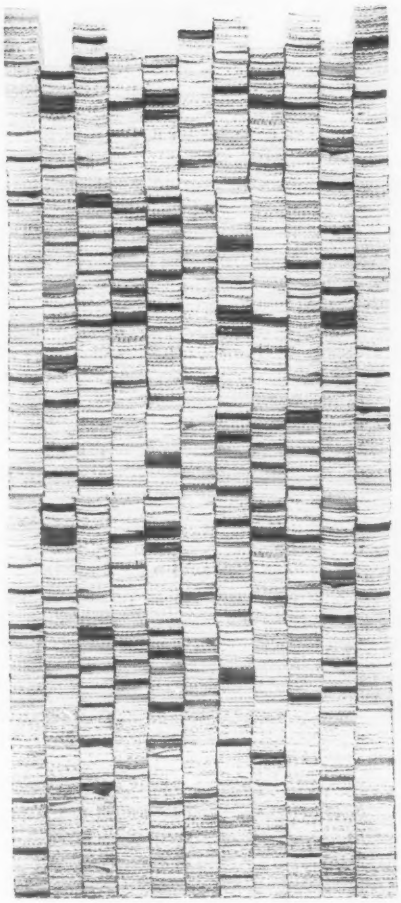
What did they say? Old IBM cohorts Frank King (now with Lotus) and Mike Maples (now with Microsoft) recently got together to discuss agreeing on something. We're not exactly sure what it is, although we hear a press release may be in the offing sometime. All we know is that it involves setting some kind of standard that spreadsheets should follow and means sharing a lot of code.

Our best guess is that it has something to do with either file formats or Microsoft wanting in on Blueprint, the Lotus specification that allows applications to easily fetch data from other applications.

One thing we know they discussed was the shipment of Presentation Manager spreadsheets. Each bragged that they would be the first to foist one on the market, but in true IBM fashion, each declined to give the other any details.

He's mad as hell. Jeff Bernknopt has a bone to pick with poor ol' *Computerworld* and the way we have hyped SQL with a long-running series of articles. It is not that Jeff hates SQL; he just hates to see it touted again and again as the end-all and

Theirs.



The second most reliable impact printer did this much before it stopped. It wound up in the repair shop after 7,000 hours or ten months of printing.

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PE12805

be-all. In fact, he threatened to rip CW in half next time it happens. We may have to bury the next one in the middle of the Manahattan phone book.

Bernknopt's contempt for SQL gurus has focused on the latest affront, a two-part series by Fabian Pascal we ran called "Which PC DBMS should I choose?" [CW, Aug. 8 and 15]. Fabian argues that users should choose one that implements relational principles and SQL. Jeff agrees that both are important features but are wholly inadequate when judging the overall worth of a DBMS.

Instead, end users need a DBMS that maintains ease of use but also offers the "greatest power and set of capabilities." Here, things like graphics, access to calculations and file-exchange capabilities with spreadsheets are paramount. For developers, things beyond SQL are important, such as a high-level procedural language, a screen handler and computer-aided software engineering tools — all of which help define a fourth-generation language.

OK, Jeff. We still like SQL, but our SQL blinders are coming off, pronto!

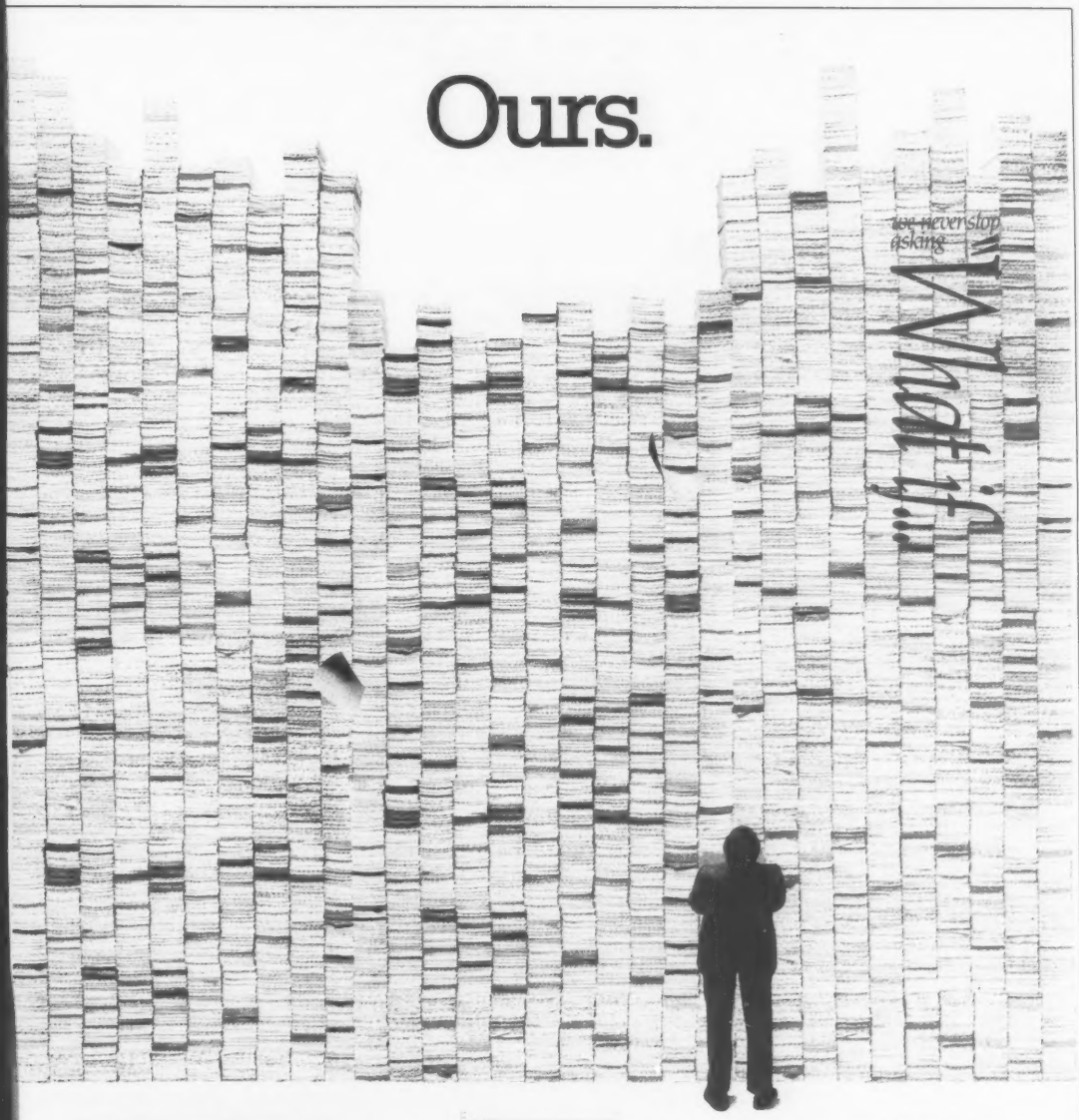
Ready, Set, GOS/2. You've read the articles that say OS/2 is going nowhere. You've probably rejected the product because it does so little and costs so much. But OS/2 may still have a future in the near term. It's called Lotus 1-2-3 Release 3.0.

This little baby that's way overdue may be just the thing Microsoft has been waiting for.

See, Release 3.0 runs under both Microsoft's MS-DOS and OS/2. Under MS-DOS, though, power users will still probably need at least 1M byte and definitely an AT or better. To run under OS/2, all you need is a couple of megabytes and an AT or better. You don't even need the added baggage of Presentation Manager. In return, you'll get nearly unlimited memory (your budget is your main limitation) and multitasking.

Given the choice, many just might decide that OS/2 ain't so bad after all.

Barney is a *Computerworld* senior editor, microcomputing.



The HP RuggedWriter 480 printer did this much before we stopped counting. After the equivalent of 20,000 hours, it just kept working. And working.

Only HP could have built an impact printer as reliable. Or as fast. At 480 cps for draft and 240 cps for letter quality, you'll be able to turn out everything from letters and spreadsheets to six-part forms, at least 20% faster in letter quality mode than other 24-wire impact printers.

And with its 180 x 360 dot per inch resolution, it's certainly no slouch when it comes to graphics.

It's also compatible with the computer system you already have. IBM PCs. PC-compatibles. And of course, HP.

And compatible with your budget. At a price of just $1695.

For more information, call 1-800-752-0900, Ext. B287. And you'll see why the competition just doesn't stack up.

HEWLETT PACKARD

Too hot?

FROM PAGE 45

Another solution involves increasing reliance on third parties such as training firms, sophisticated software resellers, computer dealers and the vendors themselves.

"We get really good support from Corporate Software [a software reseller]. They seem to know more about Lotus than Lotus does," Sellers said.

The good mix

Some use a variety of approaches. "We are doing more leveraging of outside vendors. A computer store has been brought on site, and we are taking more advantage of using vendor support lines," Horwich said.

For the American Cancer Society — with 21 Chicago area offices — one answer may be to acquire modems and software that allow remote manipulation of data. That way, a specialist can fix a user's problem without traveling to the site.

But that is not enough. "One thing is to push hard to get more budgeted for training for users and our own staff. But we also look for products that will be the most usable, even if we have to sacrifice some bells and whistles," said Jonathan Schwartz, EDP systems manager for the American Cancer Society in Chicago.

Another trick is to keep the list of supported products small and make sure chosen products are as easy as possible to use. "The fewer products we have, the better. We can't make anybody buy a particular product, but we do offer encouragement," Sellers said.

Encouragement can come in a couple of forms. One is offering training on supported products, as Sellers does. But perhaps more importantly, he is better able to answer tricky questions about supported products.

Managers grappling with this problem have no magic answers. But with a bit of thought and offloading support whenever possible, they might just keep their sanity.

Finance

CONTINUED FROM PAGE 45

dicate that financial managers in companies throughout the U.S. are reacting positively and aggressively to financial business systems," noted one of the research report's authors, Elizabeth E. McHugh, a manager in Arthur Young's information technology division based in San Francisco.

"They want to ensure that technology expenditures reap measurable benefits in the financial department, and they have for the most part been successful."

The findings of the survey, summarized in *The Impact of Systems Technologies on the Financial Function*, are based on the responses of 510 senior financial executives who are members of the NAA. The respondents came from a variety of companies with annual revenues ranging from less than $50 million to $1 billion.

Reaping the benefits

Approximately 95% of the respondents said the use of financial business systems on PCs in their companies has resulted in a tangible economic benefit. The benefits include significant time-savings, increased productivity, improved timeliness, better accuracy of information and enhanced analytical capabilities.

Of the 83% of financial executives who routinely use either a PC or a dedicated terminal, 85% said they use spreadsheet software, nearly 65% use word processing programs, more than 50% use database management software and 49% use graphics programs.

According to the survey results, technology is used aggressively in most of the major functional areas for which financial executives are normally responsible. Financial business systems are most often used for management reporting, budgeting and forecasting, 75% of the respondents said.

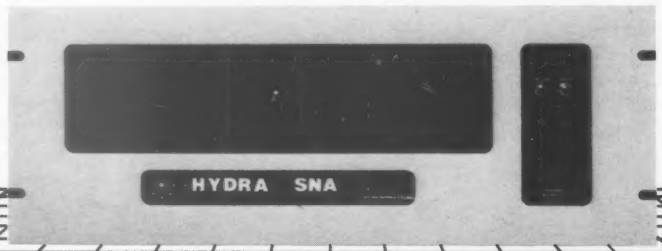
Critical to establishing a successful financial business system are the accessibility of technology resources and the involvement of company management in technology implementation, the report noted. The software tools used to support most of the financial functions analyzed in the survey reside more often on PCs than on centralized corporate computers.

Despite a trend toward personal and departmental computing, the report's authors noted, it remains common to use centralized corporate computers to support financial applications. Centralized computers are used for management reporting by 67% and for financial accounting by 74% of respondents.

Getting senior management involved with technology implementation is the second key to establishing a successful financial business system.

The use of technology by senior executives promotes greater use of computer tools by staff members, creating additional benefits in productivity, efficiency and other areas, the report said.

NEW FROM
JDS MICROPROCESSING
HYDRA SNA



A Direct Channel Attached
Protocol Converter/Controller
FEATURING SNA SUPPORT

JDS MicroProcessing proudly announces a new addition to their direct channel attached line of protocol converter/controllers.... HYDRA SNA.

HYDRA SNA offers full SNA support allowing ASCII terminals, PCs, and printers to be interfaced directly into an SNA network.

HYDRA SNA provides 3270-type emulation for ASCII terminals and PCs, supports many popular ASCII terminals, and offers key mapping facilities allowing additional terminals to be supported. HYDRA SNA supports local and remote applications and provides password, call-back, and positive logoff security.

HYDRA SNA features quality design that provides outstanding performance for connecting devices and offers flexibility that incorporates quick set up for normal operations and an easy to use configuration facility.

HYDRA SNA is available in 8-port increments from 16 to 64-ports. The design features easy expansion enabling models to be upgraded up to a total of 64-ports. HYDRA SNA attaches to IBM and compatible 360/370/30XX/4300 mainframes.

For full details Call 800-55-HYDRA. In California call (714) 770-2263.

JDS MICROPROCESSING
22661 Lambert Street, Suite 206, El Toro, CA 92630

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1-2-3

CONTINUED FROM PAGE 45

With the interface, the company said, users no longer need to use multiple keystrokes for manipulating drop-down menus and submenus in 1-2-3, although they may still do so if they choose.

In control

According to Marq, the user is given additional control of what can be viewed on the screen by using the mouse's point-and-click functions.

With this interface, the user can open and move worksheet windows, select ranges and define column widths within the worksheet and drag or push blocks of the worksheet on or off the screen. The interface also lets users select their own status and function keys from screen menus, and it expedites data entry and editing with automatic cursor controls.

Marq Navigator for 1-2-3 is compatible with 1-2-3 Version 2.0 or 2.01 and requires 35K bytes of memory. It carries a list price of $149 and is available now, the firm said.

Meanwhile, Personics Corp. in Maynard, Mass., has introduced its Look & Link application for 1-2-3. According to the firm, this product allows users to link and merge worksheets stored on disk to the 1-2-3 spreadsheet while viewing the linked worksheets on the screen at the same time.

By linking worksheets that are stored on disk, users can build 1-2-3 models that would otherwise be too large to offload to random-access memory; they can also save the limited hardware memory capacity for other applications. By breaking the linked worksheets into smaller portions, the company said, the applications will consume less than 640K bytes of conventional memory.

The simple things in life

The product also simplifies the development of complex applications, Personics said. Portions of the worksheets can be developed separately in smaller, simpler portions, then linked together.

The second worksheet is viewed in a pop-up window that the user can resize or reposition on screen. The data cannot be entered or edited in the pop-up window, but it can still be scrolled and moved about the screen.

Look & Link is compatible with 1-2-3 Versions 2.0 and 2.01 and requires less than 640K bytes of memory. It carries a list price tag of $99.95 and is available now.

On-Line Software Introduces an Old Concept.

The Strateg

Casablanca…President Franklin D. Roosevelt and Prime Minister Winston Churchill find something to chuckle about during their historic meeting. (Credit: Bettmann)

Like it or not—and we do—we all live and work in an IBM world.

You work with IBM.

We work with IBM.

Let's work together.

Sure, there are proponents of minis and micros.

One wishful company even ballyhooed a mid-frame and when that didn't pan out they created a small-frame.

But the undeniable fact is that Big Blue has taken this industry and created it in its own image.

Pardon us if we seem a trifle unadventurous but we think we know a winner when we see one, so where IBM goes, we follow.

We fill their gaps. Plug their holes.

Write programs they don't have time for.

In short, make the whole thing run just a little bit better.

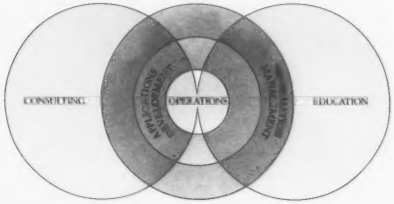
ic Alliance.

■ WE'RE LOOKING FOR A YES MAN.
OR WOMAN.
OR BOTH.

At most companies there are a hundred people who can say no but only a few who have the authority to say yes.

We're looking for those people. A few good men you might say.

And, at the risk of sounding high and mighty, there's something in it for you.



ON-LINE SOFTWARE'S THREE TIERED STRUCTURE

■ A CHANCE TO BE A HERO.

A chance to get ahead.

You see, managing a DP department is no different from most of life's other endeavors. It's not what you know, it's who you know.

Obviously we'd like for you to know us better. To make it easier, we've established special teams exclusively to service national accounts, federal systems, service bureaus and resellers.

Big guns for big hitters, if you'll allow us to mix a metaphor. What's in it for you?

Help.

Help with product evaluations, help with training, help with technical consulting and systems integration, help with applications development, operations and information management.

Sure, it's all available individually from other sources, if you have the time to wait for ten different phone calls from ten different reps.

We're betting you're too busy for that.

We're betting you're ready for an alliance, an understanding between yourself and a company whose charge in life is to take what IBM has created and make it better.

A strategic alliance.

It works in other businesses every day.

It works for politicians.

It works for lovers.

It even works for kids on the playground.

It worked for Roosevelt and Churchill.

It can work for us.

"I WAS AN MIS DIRECTOR FOR 27 YEARS.
I ALLOWED ONE VENDOR LUNCH
EVERY TWO MONTHS.
I WAS NOT EASY TO SELL TO.
I WAS WRONG."

A recollection from Howard P. Sorgen, President of On-Line Software

Personal experience. Can't beat it.

Especially if you've made a few mistakes and you've learned from them.

I have.

It wasn't that I was too smart or too powerful or too good to see all the people who had all that software they were trying to sell.

I was too busy.

I had a business to run so I did what all MIS managers do—leave it to my DP people to pick up a piece here and a piece there and make them fit.

It works.

It works great in the short run. And when you're so busy you can't see beyond the next project, that's the most most companies can, or do, hope for.

But take it from a guy who's been doing this for over 30 years.

Stop.

Sit back.

Relax.

Take a break.

Look around.

Find someone who has more to offer than just a piece of software. Someone who can help. Someone you can talk to, every day if you need to.

I did. I liked the way it felt, thought other DP managers would feel the same way, and that's why I'm at On-Line Software today.

By the way, my number's (201) 592-0009 and my extension is 2823. Call if I can help.

Howard Sorgen

Before You Buy Another P
Ask Yourself a Simple

North Africa...U.S. paratroopers on the way to their next mission. (Credit: International News Photos)

The time has come for the big software rout. Little companies acquire big companies and big companies fight to hold their position against an onslaught of corporate raiders, disenchanted financial advisors and a skeptical Wall Street.

Those brilliant boys who sat in back-rooms and changed the world can no longer afford to bring their product to a more complicated and more expensive market.

What used to be a craft is now a business, and that business is in turmoil. What used to be an innovative, entrepreneurial undertaking has been overwhelmed by a cover-your-butt mentality.

Rightly so.

Where will you be, who will own the software that runs *your* machines when the dust settles?

Systems software purchases are commitments. Commitments that ask *your* people to generate *your* work to satisfy *your* customers, a certain way for a very long time.

Changing that is rarely easy, always expensive.

■ WHAT HAPPENS WHEN YOUR FAVORITE LITTLE SOFTWARE COMPANY GETS EATEN UP BY SOMEONE YOU REALLY DON'T LIKE?

Pick up The Boston Globe, The Wall Street Journal, Business Week and you've got an arm load of software mergers, purges and shake-ups.

Some good. Some bad.

All affect you.

iece of Systems Software, Question. Is it Safe?

With a growth rate as high as 75%, constant new releases and several major acquisitions, On-Line Software started as, and remains, an exploding star.

In that atmosphere any company must work hard, very hard to keep its feet on the ground. Because all too often, asking a business partner to share in your glory carries an unspoken and unintended commitment to ride out your downfall.

It's a hard lesson, a lesson best learned from IBM—who we've mentioned many times before and we'll mention many times again. It's okay to take chances, it's even necessary to take risks, but never, ever pass them on to your customers.

■ BE CAREFUL WHO YOU BUY YOUR PROBLEMS FROM.

Safe. Is it safe? Is it a safe buy?

Safety is where it has always been.

In numbers.

In stability.

In support.

In growth.

In training.

In specialization.

In finding the high ground and holding it.

In an industry too often trying to be all things to all people, On-Line Software passes up many opportunities in order to solidify one position, to be authorities, authorities in IBM systems software.

In an industry whose raison d'etre is to sell more and more product, On-Line Software started by offering consulting, and now trains more people in the intricacies of IBM systems software than most anyone. In an industry in the midst of a shake out, we do the shaking, impervious to hostile takeover.

■ SO HOW DO YOU ELIMINATE THE INHERENT RISKS IN SOFTWARE PURCHASES?

Thirty-day trials help. But if you can feel secure with just a month's experience under your belt, you're better than most.

Look for specialization in IBM, especially in CICS and DB2.

Look for a company with a history of a new release for every product every year.

Look for tech support.

Look for educational offerings not only where the product is sold, but in the field where it is used.

Ask consultants and value added resellers which products they use to make their jobs easier.

Look for a company that asks smart questions.

Look for a company that comes to you.

Most of all, don't jump before you know what's down below.

THE NEW DEAL.

Things change.

In this business that's the name of the game.

So what seemed like a great decision—what was a great decision—a year ago can often turn into a worthless piece of software when your hardware changes or your operating system changes or your business changes or you just change your mind.

Until now all you could do was bite the bullet and wait for next year's budget.

That's all changed.

If you got it from On-Line Software, then just send it back.

Here's how it works.

License any On-Line Software product.

Take maintenance.

Use it.

Then, six months later—or six years later—if you're through with it or just don't need it or just want something else, trade it in, dollar for dollar, for another On-Line Software product.

That's it.

If you're looking for the fine print, there is none.

If it's an idea that sounds right for you, give me a call for the details.

Jack Berdy

Jack Berdy, Chairman and CEO

P.S. I want to ask a favor—a small one, I hope.

As far as we know right now, no other company offers a guarantee that even comes close. In fact, as far as we know, no other systems software company has any extended guarantee at all.

That too will change. Sooner or later, they'll all have to do it just to keep up.

So the first time you hear some software sales rep going on about his company's great unconditional guarantee, please remember that it all started right here.

Thanks.

The DP Ass

The Homefront...Dedicated workers are the backbone of any modern operation. (Credit: UPI)

■ If you're over 30 you probably remember the ads on the inside of match book covers, "Learn To Be A Key Punch Operator And Enter The Exciting World Of Computers."

Now, with 1990 less than 500 days away, it all sounds so naive, doesn't it?

Well, that's the way a lot of people got started. It beat working in the mill or answering the phone all day. To be fair it still does.

But the glamour's gone.

Today there are 900,000 DP professionals in the United States.

There's only one problem. We need almost 2,000,000 more. We measure backlog not in days or months but in years. Years!

Ten years ago, no one ever thought that computer programming would become a white collar assembly line.

So, the exciting world of computers has come down to one thing—a lot of hard work.

Programmers never seem to get ahead.
They never get caught up.
Their job will never be finished.
There's always more to do.
Sort of like working in the mill.

■ TELL YOUR DP MANAGER SHE JUST NEEDS TO WORK HARDER AND GUESS WHAT SHE'LL SAY.

Put a machine that does its work in milliseconds in the same room with people who are inexorably tied to the cycles of the sun and moon and seasons, and something has to give.

Inevitably, it's the people.

Frustration, anxiety and desperation build until writing an application program, essentially a creative undertaking, turns into a crank-it-out-and-shut-them-up task.

Everyone—except the computer—loses.

There's much more to be gained from making application development easier than just making it

s embly Line.

faster. Taking out the drudgery, the rote, the repetition, leaves room for reflection, time for inspired daydreaming—essential activities that are at best fond memories for most programmers.

UFO, VERIFY, InterTest, IntelaGen, DataVantage, and now, most of all, CasePac help bring it back. They buy you time.

Time, we hope, not to do things faster, but to do them better.

■ *HI-TECH INTERCOURSE.*

Applications programmers are much like God, or Dr. Frankenstein, depending on the outcome.

They conceive a program.

It's born.

It lives.

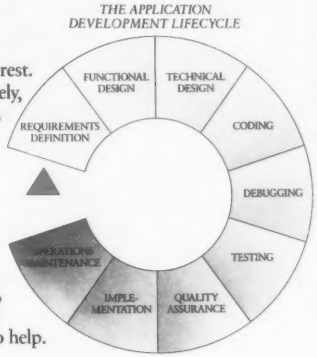
It grows.

It ages.

It is laid to rest.

Appropriately, the whole process is called a lifecycle.

No matter where you are in that lifecycle, from the first gleam in your eye to resurrecting a geriatric program, there's an On-Line Software product to help.



■ *CASEPAC.™ THE GENE POOL.*

CasePac.* Automated software development for DB2 with a powerful data dictionary.

CasePac gives you the tools to automate design and modeling functions. But most important, it stores information about your designs, models and data flow diagrams—everything it takes to build an application—in one central place where everyone can get to it. It not only stores information about current projects, it stores information about existing applications, too. So everything is consistent. Everyone works with the same definitions and standards.

Because nothing lasts forever—although some applications programs seem to—CasePac also helps you with that nasty little chore called maintenance.

Once the creator is gone—and most creator-types don't leave good notes—it falls upon the meek who have inherited the mess to figure out how it was put together and keep it going as long as possible.

With CasePac, the records are there. Records that can be used to fix what you've got. Or grow another.

CasePac. For DB2, it's where life begins.

■ *UFO.® THE BREATH OF LIFE.*

Go from prototype to finished application in record time with the most resource-efficient development system on the market. It's the most flexible, too, with full portability across CICS, CMS, TSO—even the 9370.

UFO makes it easy. Many applications can be built using menus alone, with the help of pre-programmed logic and built-in functions. For even more speed, you get automatic data base access—including DB2 and SQL—as well as an active data dictionary that makes maintenance a breeze.

■ *INTELAGEN.™ CHAIN OF COMMAND.*

Instead of writing COBOL or PL/1 code line by line, step by step, let IntelaGen do it for you.

IntelaGen generates stand-alone COBOL or PL/1 code from simple commands that cover all structured programming and computational functions.

It accepts either IntelaGen or COBOL commands, so novices can learn as they go. When they do make a mistake—and they will—an on-line syntax editor tells them right away, making IntelaGen the code generator that's easy to use even if you don't know how.

■ *INTERTEST® AND DATAVANTAGE.™ PHYSICAL FITNESS.*

InterTest is the number one CICS applications debugging and testing tool in the world.

With good reason.

It prevents all application errors known to CICS—and does it with such ease and grace, it makes one of your most grinding jobs seem a snap.

For IMS and DL/1 data bases, DataVantage automatically creates an accurate subset for testing. There's no need for manual coding since DataVantage does all the heavy labor—from query and updating to comparing data bases before and after testing.

■ *VERIFY.® RUNNING THE GAUNTLET.*

VERIFY determines if your program will wimp out when the going gets tough.

It lets you see the real impact of changes you've made to your programs *before* you get production system "surprises." VERIFY is an automated CICS quality assurance tool that handles the full gamut of testing needs. It tells you if your applications will work as expected after changes are made to your program code, CICS releases, operating systems, hardware, or transaction load.

In short, if anything changes, VERIFY can test it.

**CasePac is a joint venture with TATA CONSULTANCY SERVICES.*

How Much Trouble Wou
Unplugged Your Mainf

The Pacific...Lucky 13, a Grumman Hellcat, forces commanders and seamen alike to ponder the dilemma of a unit out of commission. (Credit: U.S. Navy Photo)

Yes, everyone knows that computers don't go down for a whole day anymore.

Or do they?

Would you admit it if it happened to you?

So let's forget about a day.

How about an hour?

Or, if you're an "average" MIS Department spending an "average" of over $5,000,000 a year which is an "average" of almost $100 a minute, well—you get the point.

OPERATIONS IS EVERYTHING.

If you're willing to pay the price there are a few mainframe manufacturers who will sell you two computers instead of one, so if one goes down you've got a backup.

Sort of like carrying a spare set of batteries for your pocket calculator.

Whether or not you need fault tolerant or faultless computers, the simple fact is computers do go down.

Often. Regularly.

Usually during your prime shift, right in the middle of your business day—and these days you don't have a business day if your mainframe isn't on-line. Usually it's a programming or software problem.

Yes, we said it. Believe what you like, but there's

uld You Be In If Someone frame For Just One Day?

no such thing as faultless software. Or faultless people.

There are simply no magic potions or secret formulas or revolutionary programs that will bail your rear end out at 2 a.m. when your batch programmers are fighting with CICS for a file.

There are no answers.

There is help.

■ *STABILIZE® SHELL SHOCK.*

CICS programs are born with the jitters.

STABILIZE is like pumping 25 milligrams of lidocaine into the system every time it gets jumpy.

It prevents crashes and dynamically repairs damage caused by corruption of CICS management modules and storage chains, systems or application loops, and all sorts of systems abends. And with its unique InterTest "handshake", errors won't recur.

■ *TOOLSET-DB2.™ LIBERATE YOURSELF.*

Bogged down in the really boring, repetitious parts of your job?

TOOLSET-DB2 is a complete set of tools that automates and speeds many of your routine tasks such as writing SQL statements.

With TOOLSET-DB2, you won't have to issue complex catalog queries over and over again to determine object definitions and relationships.

You won't have to do special programming to get DB2 data into a physical sequential data set—or spend long hours setting and removing DB2 security.

■ *CICS CENTRAL.™ SEE THE WORLD FROM THE COMFORT OF YOUR CHAIR.*

CICS Central is a powerful data center tool that lets you operate multiple local and remote CICS regions from one central location.

With CICS Central you can anticipate and correct CICS operational problems *before* your users notice them. All CICS and VTAM messages can be filtered, color-coded, and replied to automatically.

How's that for comfort?

■ *OMNIGUARD.® COMPUTER FRAUD? ADMIT IT! IT'S EXCITING!*

How about whoever it was that stole 16 million taxpayer records from Revenue Canada? Hah! Got even with them, didn't he? Our favorite is the disgruntled CFO who held his employer's files hostage and demanded a ransom when he didn't get an expected pay raise.

Love it! Love it! Love it!

Until it happens to you.

Then it hurts. Bad.

OMNIGUARD is the most comprehensive software security system available anywhere at any price.

Need we say more?

■ *DADS.™ WHAT HAPPENS WHEN YOU ASK YOUR MAINFRAME FOR A SIMPLE FAVOR AND IT TELLS YOU TO TAKE A HIKE?*

"Files Not Available." "Datasets In Use."

It's almost dawn. It's not funny.

You need to update your CICS files and some batch programmer has them. Who's in charge here anyway? DADS is a file and application control system for CICS/MVS that performs dynamic allocation/deallocation and automatic enabling/disabling of transactions and programs, thus allowing 24 hour CICS availability.

True, you may not need it right now.

But then again, it's not 4 a.m.

■ *VSUM.™ THREE MILLION DOLLARS FOR A MAINFRAME. FIVE MILLION FOR DISK SPACE. FILL THEM UP, THEN BUY MORE?*

Let's say you need to add 100,000 new customers.

Everything's full so where you gonna put em? Especially since all of your programmers are hiding away a little storage space "just in case they need it".

VSUM can figure out how much space you'll need, when you'll need it, and where to find it—before you're in trouble.

It saves time. It saves disk space.

It could even save the price of a new controller.

■ *FILESAVE.™ SAVE YOUR EMPLOYEES FROM A LIFE OF DRUDGERY.*

If you worked your way up through the ranks, once upon a time you probably had to recreate lost or damaged files. And you probably hadn't done the necessary backup. And you probably got into trouble.

And the same thing is probably going on in your DP department right now.

FILESAVE can keep you out of trouble by reducing your backup frequency, automating the dataset recovery process and providing fast and accurate forward and backward recovery of VSAM datasets.

Most of all, it does the jobs no one else wants to do.

How to Turn Data

Location Classified…Six men from an American photo reconnaissance unit sprawl over the French landscape. (Credit: Bettmann/Black Star)

Into Information.

Lest we forget, all those impressive numbers, all those binary figures, all those bits and bytes and data bases that you took so much time to collect and spent so many millions of dollars to input and output and sort and store are absolutely worthless to the average branch manager in Poughkeepsie who isn't meeting his or her sales goals.

And you surely remember that meeting one's sales goals, or productivity goals or quality goals is what most businesses are all about.

Not bits.

Not bytes.

Not data.

Business is about information, and information and data are not the same.

THE NEW RAMIS.®
WHAT YOU DON'T KNOW CAN'T HURT YOU.

Converting data into information is easy, if you know how to access a mainframe and you're not already 3 months behind with all your other work.

There are alternatives.

Take the new RAMIS Information System for example.

According to Rick Holtmeier, our Executive Vice President, pulling a management report with RAMIS is so easy even his secretary learned to do it in 10 minutes.

According to Rick's secretary, it's so easy even he learned to do it in an hour so now she doesn't have to bother.

Okay, let's go back to the guy in Poughkeepsie.

He doesn't know how to access a mainframe —let's face it, you don't want him to know how to *really* access your mainframe. He doesn't know how to write a macro. He doesn't know procedural syntax from his dear Aunt Maude.

He does, however, have a commanding knowledge of the alphabet. With the RAMIS report writer that's all it takes.

For instance, if he wants to know the total revenue for each product purchased by Acme Widget in the fourth quarter of last year, he simply types—using as many or as few fingers as he chooses—Show me the total revenue for each product purchased by Acme Widget in the fourth quarter of last year.

RAMIS then displays a table listing each product and the total revenue from Acme Widget during the fourth quarter of last year. What could be simpler?

Charts and graphs could be simpler.

RAMIS does that too, with only a few additional keystrokes.

For the really inquisitive, RAMIS, RAMIS/PC Workstation™ and RAMIS English™ have pop-up menus and non-procedural syntax that provide external data selection and sequencing options, and let your man in Poughkeepsie manipulate data with summary operators, temporary fields, totals, and basic statistical operations.

It's just that easy or just that hard, depending on how you want to play it.

BULLETIN.™
WHEN IT ABSOLUTELY, POSITIVELY HAS TO BE THERE AND YOU DON'T HAVE ALL NIGHT.

Which is more unreliable, the U.S. Mail or your own internal routing service? Either way, if you haven't missed an important message in the last month, count your lucky stars. Business *is* communications, and BULLETIN lets you take charge.

With BULLETIN you can automatically send, receive, track and file everything from a hundred page business plan to a top secret dinner invitation to the hunk or hunkette across the hall. You know who has received your memos and who hasn't and who has viewed them and who didn't bother.

Getting people to act on them is a problem we haven't yet solved.

OMNILINK.™
THE GREAT COMMUNICATOR.

Anybody can make micros and mainframes talk to each other. OMNILINK lets them communicate.

If you've looked at PC to mainframe links, you've probably come away with a few questions.

Like, how do I learn all those computer languages? How do I handle security? How do I control the information flow? How do I talk to other PC users? How do I reformat data? And on and on and on and on.

Get OMNILINK.

Of course, we could go on and on and on.

Low Tech Solutions to

England…High spirits and camaraderie are vital ingredients in making pilots out of men. (Credit: Reuters/Bettmann)

High Tech Problems.

■ Running 50 or 100 DP departments all over the world is not unlike maintaining a small army. Hardware and supplies. Logistics and communications.

And most of all, of course, people.

If you're one of the very biggest companies in the world and you need a systems integrator, you're probably going to call IBM or EDS or Arthur Andersen. And you'd probably be right to do so.

(So much for the free publicity for our competitors.)

What if you're not one of the biggest? Or, more likely, what if you need help on the departmental level?

What if you need an elite troop who can move in, assess the situation and do the job quick, without carrying around a lot of overhead?

Consider On-Line Software.

Especially if you need technical consulting.

Definitely if you're moving into DB2.

Always if you're CICS.

On-Line Software started as a technical consulting company for CICS in 1969.

Back then CICS was the really "sophisticated" end of the business and On-Line Software ruled the roost.

To some extent it still is and we still do.

But now there are a hundred companies who do it for less. Still, our old customers keep on coming back and new ones walk through the door every day.

Perhaps that's because—as we've said throughout this treatise—things are not as simple as they used to be.

Who needs just a CICS consultant anymore?

Or just a batch consultant?

Or just a DB2 programmer?

Or just a piece of software?

Nowadays, in this business, if you're just anything, you're nothing.

That's why we've expanded our consulting services, integrating them with software and supporting them with education and training so that it's sometimes hard to tell where one begins and the other stops.

However—and this is important—our consultants and educators don't sell software.

Objectivity, especially if you're a consultant, is your life's blood.

Sure, our consultants use our products whenever it serves their needs. And sure, they miss a lot of opportunities to sell a lot of software. But every person who walks through your door is given one directive: do the best job he can with allegiance to no supplier.

It costs a little business.

It keeps a lot of friends.

■ PLANNING A WELL RUN DP OPERATION IS LIKE REHEARSING FOR HAMLET.

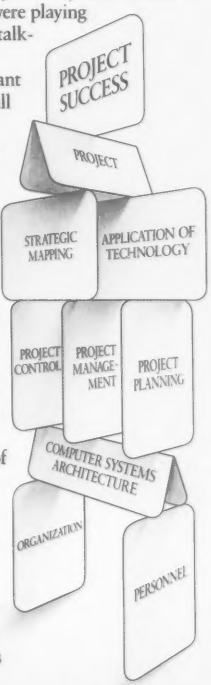
Remember your high school play? After you'd learned all your lines—or learnt if you were playing Shakespeare—the coach started talking about plot points.

Those were the important parts, the parts where most of all you couldn't mess up. If you messed up at a plot point then everything else messed up and the audience laughed. It's just the same with DP planning, only if you mess up nobody thinks it's funny. Instead of key plot points, our management consulting people call them "csf's" or critical success factors. In other words, "Those areas where things must go right for business to flourish."

Remove any block and it all falls down.

By analyzing over 150 of these csf's you can predict the chances that your project will be done on time and on budget—or done at all for that matter—before you begin.

Since, according to some industry reports, half of all projects begun are aborted before they're finished, it keeps your business from being just another crapshoot.



CRITICAL SUCCESS FACTORS

THE SMARTER THE TROOPS THE SMARTER THE GENERALS.

No one famous said that.

But they should have.

Each year On-Line Software teaches over 13,000 students—your employees—how to write your programs and operate your systems, in 750 classes taught by 32 full time instructors at ongoing offerings in New York, Atlanta, Boston, LA, Chicago, Detroit, Denver, Hartford, Princeton, Cleveland, Washington, Houston, San Francisco, London and various cities throughout Canada and Europe.

If you're somewhere we're not, we'll come to you.

Asked to brag a bit, John Morbach, Senior Vice President of Education, says, "You name 'em, we've trained 98% of 'em."

We train IBM.

We train EDS.

We train McDonnell Douglas.

We've surely trained someone in your own shop.

We offer classes in everything from applications programming to systems internals.

Our most popular courses are CICS Internals and CICS Command Level.

Our hardest class is VTAM, so hard in fact that when we discovered even VTAM professionals were having trouble we softened up and started "Introduction to VTAM".

If DB2 is in your future, we have four classes covering concepts, design, applications programming and systems, and we have them now.

In most cases, the instructors are the same people who developed the class, so students are never stuck with a teacher and a book and little else to go on.

Of course, all products, especially On-Line Software products, are always taught on the latest releases.

WHAT DO YOU DO WITH AN EXTRA $3 BILLION AND NOWHERE TO PUT IT?

Here's the lowdown.

Pennzoil had an extra three billion, cash money. (We won't mention where they got it.)

They needed to get it from New York to Dallas, Fed to Fed.

A number of banks wired the money to Manny Hanny.

Manny Hanny wired it to the Fed in NYC.

NYC wired it to Dallas.

The whole thing came down in less than 12 minutes.

It was the largest transaction in the history of the world.

On-Line Software consultants helped build the systems that did it.

And nobody lost a dime.

"WE TRAIN OUR PEOPLE TO BE NICE EVEN WHEN YOU'RE NOT."

Debbie Gregory, Assistant Vice President of Marketing Services

You just can't blame it on the computer anymore, can you?

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Debra Gregory

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Computerworld Extra on IBM
Issue Date: November 16 Ad Close: October 14

Despite growing challenges, IBM is still the industry leader. And after 1987 saw a year of promises from Big Blue, 1988 brought a year of reorganization in an effort to fulfill those promises.

On November 16, *Computerworld Extra,* a special publication from *Computerworld,* will take a close look at that reorganization. It will focus on the products and directions that Big Blue announced during the last 12 months—and reveal how users have reacted to them. It's an important story, and one you won't want to miss!

Computerworld Extra will look closely at IBM's reorganization with planned topics like:

- **IBM's new mainframe strategy.** Experts believe the company must reposition the mainframe as a database machine and network hub. We'll look at new and future mainframe technology from Big Blue.
- **A beefed up software front.** Two new software-only divisions should make IBM an even greater force in the applications market. Here's a look at the strategies and likelihood of success for these new segments.
- **The perils of reorganization.** We'll examine the effects of a radical restructuring—including the redeployment of thousands of employees from the factory to the field.
- **The new 'team approach.'** We'll look at the success of IBM's new Information Systems Investment Strategies (ISIS) in increasing user computer investments.

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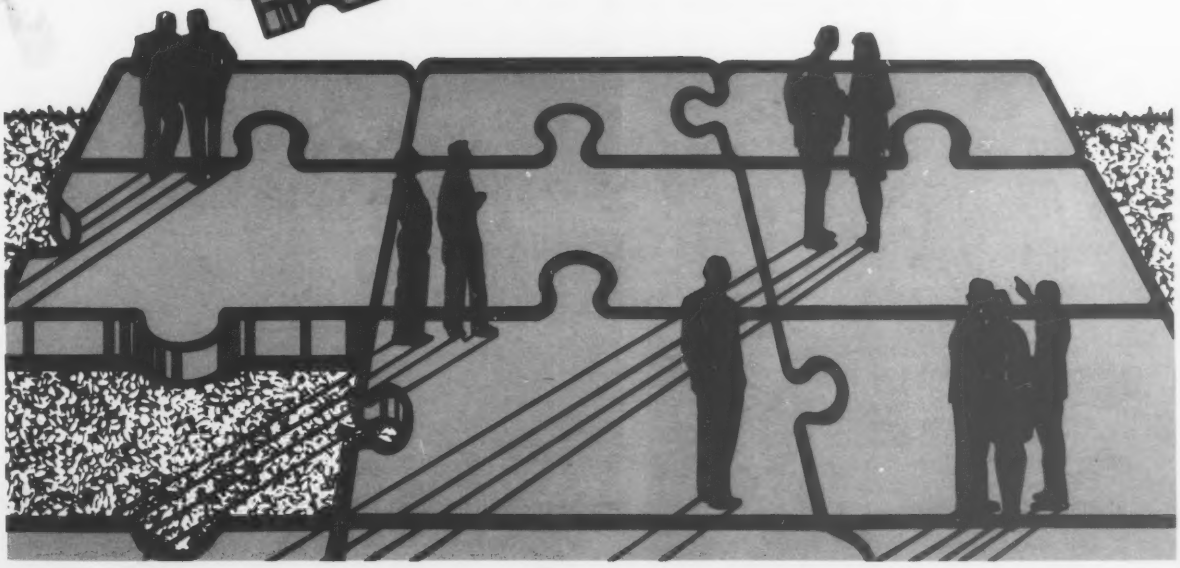

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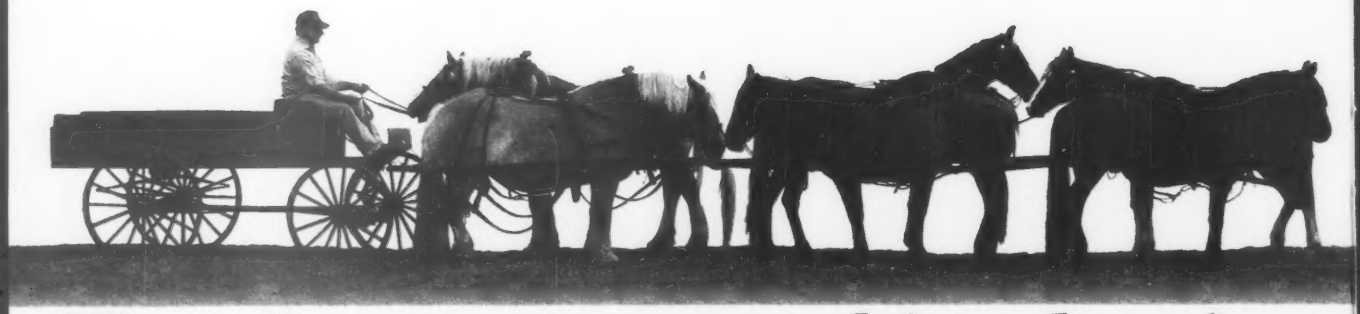

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NETWORKING

DATA STREAM

Elisabeth Horwitt

Nets on the stump

Lately it seems the election-year bug has bitten some of our favorite vendors. DEC, IBM, AT&T and others are shouting "standardization" and "multivendor connectivity," much as certain presidential candidates are building their platforms on "more jobs," "no tax increases" and "stronger defense."

In both cases, the contenders are trying to gain power while claiming to have their "users' " best interests at heart. With equal sincerity, of course.

In this contest of slogans, IBM undoubtedly deserves kudos for finally putting its products where its mouth is. Until recently, the Big One was famous for its rock-like insistence on Systems Network Architecture (SNA) as the only network architecture it recognized.

Except for certain favored Fortune 100 customers, the company provided little or no help to users and third-party vendors that wanted to link non-IBM products to IBM machines.

In the past couple of years, IBM started mouthing support for Open Systems Interconnect but limited its OSI introductions to Europe.

All that has changed in the last few months. IBM recently announced a bevy of OSI products for U.S. distribution and

Continued on page 74

ISDN star of the day

Toe-dippers include IBM, Northern Telecom

BY KATHY CHIN LEONG
CW STAFF

SAN DIEGO — Once confined within the walls of technical panels of past Tele-Communications Association (TCA) shows, Integrated Services Digital Network (ISDN) bounded out of the closet in full force for the first time at last month's conference, with support from key suppliers such as IBM, Northern Telecom, Inc. and Intel Corp.

As expected, IBM, for the first time, dipped its toes in the tepid ISDN waters and demonstrated its 7820 ISDN terminal adapter, which the vendor had announced the previous week.

Nashville-based Northern Telecom unleashed a series of ISDN products. The company said that Wats Marketing of America, Inc. in Omaha is using its ISDN Primary Rate Interface (PRI) on its Meridian SL-1 private branch exchange (PBX) for customer service applications.

Wats America is a telemarketing group that handles approximately 10,000 calls per hour. With ISDN, the company expects to cut phone costs and speed up customer services.

The company also announced a T1 multiplexer family, the Meridian Bandwidth Controllers, which will give the Meridian SL-1 PBX T1 capabilities. The multiplexers will also be compatible with the PRI on the switch.

Agreement reached

Intel Corp. announced an agreement to implement Northern Telecom's T-Link rate adaption protocol on a chip for use in ISDN products. T-link reportedly will provide users with 64K bit/sec. transmission over ISDN networks and provide ISDN access for non-ISDN devices transmitting at 56K bit/sec. The chip reportedly lowers the cost of high-speed networking devices.

Despite the recent rise in vendor support of ISDN, the telecommunications standard

Continued on page 78

Network reaches out to homeless, hungry

BY JAMES DALY
CW STAFF

SANTA CRUZ, Calif. — In Los Angeles, a member of the municipal board of supervisors advocates putting the homeless on a barge and shoving it into the harbor.

A city commissioner in Fort Lauderdale, Fla., suggests residents sprinkle their garbage with rat poison to discourage hungry people from foraging for leftovers.

Begging can bring a 90-day stretch in jail in Seattle.

Almost everywhere you turn, the hungry and homeless are under attack. But at the offices of Handsnet, Inc., high-tech has gone to work for those with barely a dime in their pockets.

Since December 1987, the Handsnet on-line network has provided a veritable motherlode of information on services for the needy to more than 70 California- and Washington-based service providers, government agencies, public policy advocates, legal service programs and other coalitions.

A typical day on the Handsnet directory will find a listing of surplus food left over from harvest and canning operations, a rundown of which homeless shelters accept children and which are

limited to single men or families, news items from wire services, abstracts of recent hunger studies and information on the status of pending legislation that pertains to food, nutrition, housing and shelter programs.

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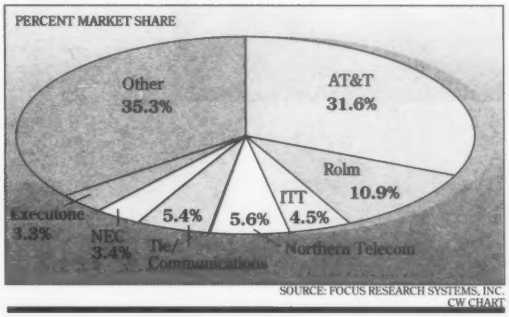
Data View

AT&T commands PBX pack

Rolm is the closest challenger—particularly in the high end of the private branch exchange market— but lags well behind the leader



SOURCE: FOCUS RESEARCH SYSTEMS, INC.
CW CHART

Novell cleans house at Networld

BY PATRICIA KEEFE
CW STAFF

DALLAS — The biggest Networld ever held produced a bumper crop of product announcements under the sweltering Dallas sun — and not all related to Novell, Inc.'s Netware network software.

Despite the heat, attendance at the third annual Netware extravaganza peaked at 15,000, with some 200 exhibitors. Novell's one major announcement — a strategic distribution and technology transfer agreement with Ashton-Tate Corp. [CW, Oct. 3] — was canceled, but a number of minor housekeeping

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Inside

- Analyze, design on T1 networks. Page 79.
- Datagraf protocol conversion to be implemented on ISDN systems. Page 83.
- Data Switch out with performance measurement family. Page 88.

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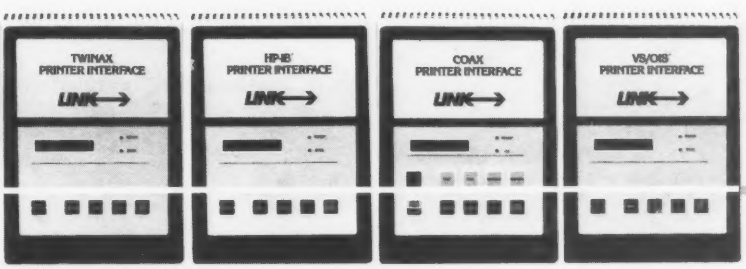

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CONTINUED FROM PAGE 73

promised that henceforth all of its OSI announcements would be global — not limited to overseas. Through its Business Partners program, IBM now markets a wide variety of third-party connections to DEC's hosts and Decnet communications system.

Most recently, IBM and Interlink Computer Sciences jointly developed products to allow Decnet to be managed via IBM's Netview product.

As a result, DEC is now coming off as being more stiff-necked than IBM about connecting to its archrival. Despite all its claims of having the best SNA links around and despite pressure from the industry, DEC still refuses to support IBM's Token-Ring and PU2.1 peer-to-peer connectivity protocols.

A DEC spokesman reportedly told a consultant recently that the vendor would support those protocols "when there is market demand for them" — a line straight out of the IBM Manual of Non-Statements of Intent.

DEC has always been a strong supporter of OSI, but nowadays it shares that distinction with most major computer, LAN and switch vendors.

How far will everyone go?

The real question is how far everyone is willing to go up the ladder of OSI protocols. Supporting Ethernet and X.25 is easy; everyone is doing that now. Products based on the X.400 electronic mail protocol link vendors' favorite office automation products, such as DEC's All-In-1 and IBM's Disoss, with other OSI-compliant services and software packages. Support of the Common Management Information Protocol (CMIP) should allow different vendors' network management systems to communicate.

Burgeoning industry support for CMIP seems like a good, though limited, solution for all those users out there who are finally trying to provide coordinated management for their autonomous, multivendor installations.

CMIP allows each vendor to retain a proprietary network management system that is tailored to that vendor's products; yet it allows those systems to exchange data, so that, for example, your SNA network manager who just lost a bunch of sessions can query the T1 network management system as to whether one of the switches out there is at fault.

Or, if you have both DEC and IBM in your shop, you use the same terminal to query both IBM's Netview and DEC's Enterprise Management Architecture systems about a sudden slowdown in response time.

For the time being, this type of setup should work well for the many companies that are still keeping their DEC, IBM and telecommunications environments separate and that will put up with limited troubleshooting across those multivendor domains.

The issue at stake is whether the market at large will eventually demand a higher level of integration — in other words, a true OSI network management standard that includes a consistent user interface and database for network statistics.

DEC HAS ALWAYS been a strong supporter of OSI, but nowadays it shares that distinction with most major computer, LAN and switch vendors.

Right now, the network manager learns a different set of commands and maintains a different database for each additional vendor installation he manages. Vendors have spent a lot of research and development money developing their proprietary network management systems with all kinds of nifty bells and whistles such as zoom-in features, mice and even artificial intelligence.

I see no strong indications that industry leaders are willing to give up the features that differentiate their products from rival offerings just to support a homogenized OSI standard.

Instead, the folks at DEC, AT&T and IBM are waving another flag, called "enterprisewide network management." They encourage other vendors to support their own network management systems, so that users can have a "truly integrated" management system.

The only problem is that while these vendors offer complete network management solutions for their own products, the tools to extend that functionality to other companies' networks are only slightly less vaporish than the OSI standard.

Again, praise to IBM — this time for being the only vendor that isn't trying to garner support for its network management system by claiming that it will eventually migrate to OSI. Those other vendors' systems will certainly support OSI — but probably not in areas that count, like database management and user interfaces.

Is it any wonder that users are just as cynical about computer companies' standards-waving as a lot of American voters are about the promises being made by this year's presidential candidates?

Horwitt is a *Computerworld* senior editor, networking.

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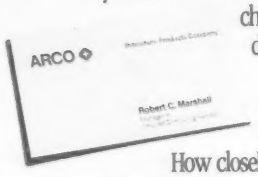

Because, and we'll say it flat out, Macintosh runs MS-DOS. Macintosh reads MS-DOS. And Macintosh shares data with MS-DOS computers.

How closely a Macintosh works with your PCs depends on what you actually need. Because Macintosh can be configured for almost any degree of compatibility. From easy speaking terms to an intimate working relationship.

If you need to run DOS programs such as 1-2-3 and dBase III, there are several easy ways to do that. One is the AST Mac286 card. Which you simply plug into a slot in the Macintosh II for AT-type performance. Or, if you prefer not even to lift a screwdriver, SoftPC is a software program that lets you run both DOS and Macintosh applications at the same time.

After closer analysis, however, you may find that the kind of compatibility that's really important is the ability to share information effortlessly between computers. Particularly if you have years of accumulated data stored away on PCs.

Here the Macintosh concept of workgroup computing proves itself in practice. In fact, you may find it easier to network Macintosh computers with PCs than to network PCs by themselves.

Two examples of that are Novell Netware for Macintosh and our own AppleShare® and AppleShare PC file server software.

With these systems in place, you can move data back and forth without complications. Files created on Word or WordPerfect are

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Macintosh, keeps PCs.

translated to their Macintosh counterparts with formatting intact. Crossing the border is equally easy when you transfer data between 1-2-3 and Excel for Macintosh.

If you don't choose to network, there are other simple ways for Macintosh and PCs to communicate. One is DaynaFile, a Macintosh disk drive system that reads data directly off any of the several DOS disk formats. Another is MacLinkPlus, a cable and software system for sharing data between two computers.

But no matter where the information originates, or how it's transferred, once on the Macintosh, this computer's unique power to analyze, enhance, and graphically communicate that information is unmatched. Which is one reason Macintosh is moving into formerly DOS-exclusive realms in such great numbers.

And unique Macintosh tools like HyperCard® software are another reason. With HyperCard, you can organize and retrieve data in a way that's akin to the mind's own workings: free association.

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Wang jumps into open systems pool

BY PATRICIA KEEFE
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. dove headfirst into the open systems pool last month, creating wave upon wave of industry-standard product plans and strategic support.

Among the announcements detailed were the following:

• Plans to support Integrated Services Digital Network (ISDN), including the integration of voice with other forms of information across global networks.

• IBM communications products that are said to permit mainframe resources and applications to access Wang VS resources utilizing IBM Advanced Program-to-Program Communications (APPC) protocols.

• Interoffix, a gateway developed by Boston Software Works, Inc. that links VS Office electronic mail to Unix-based systems.

• An agreement with The Santa Cruz Operation, Inc., giving Wang the right to market SCO Xenix System V and related applications for Wang's PC 200/300 series of IBM Personal Computer AT-compatible systems.

Wang's ISDN strategy is two-phased: First, it will develop digital transport offerings for the VS system and the PC 200/300 series; then, it will expand and advance the integration of voice, data, text and image.

The new integration services will include low-speed telemetry, interactive voice and data and high-speed data transmission, Wang said.

Trial and error

According to Wang, it is currently participating in ISDN trials with the McDonald Corp. and Illinois Bell and with GTE Florida. It is testing and analyzing voice and data applications through the ISDN Basic Rate Interface.

In addition, Wang unveiled APPC-based additions and enhancements to its family of VS Access communications products, which are said to allow IBM users and applications to talk to Wang VS systems.

Two products were introduced: LU6.2 Applications Program Interface (API), which has license fees ranging from $1,000 to $6,000; and LU6.2 Services, which is licensed at a total price of $10,000.

Programmers reportedly can write advanced distributed applications that operate transparently without multiple logons or terminal emulation.

The LU6.2 API will reportedly provide both Cobol and PL/1 programming interfaces, while the LU6.2 Services is said to offer a common transport for user-developed and Wang applications using LU6.2.

ISDN

CONTINUED FROM PAGE 73

should account for only a limited percentage of Fortune 1,000 trunk lines during the next five years, according to Forrester Research, Inc.

PRI lines will account for only 5% of trunks, because users will be unwilling to give up their private T1 networks, the Cambridge, Mass., market research firm predicted.

While local carriers will use discounted rates to stimulate an initial market demand for Basic Rate Interface (BRI) lines, such connections will represent less than 8% of total user connections in Fortune 1,000 firms by 1993, Forrester said.

Still, TCA exhibitors seemed to be expecting a hot ISDN market. Progressive Computing, Inc. in Oak Brook, Ill., unveiled an ISDN Tel-Adapter, a personal computer terminal adapter. It lets desktop users integrate phone systems into the PC to use it for speed dialing, call transfer and automatic redial. Files can also be transferred to other ISDN users.

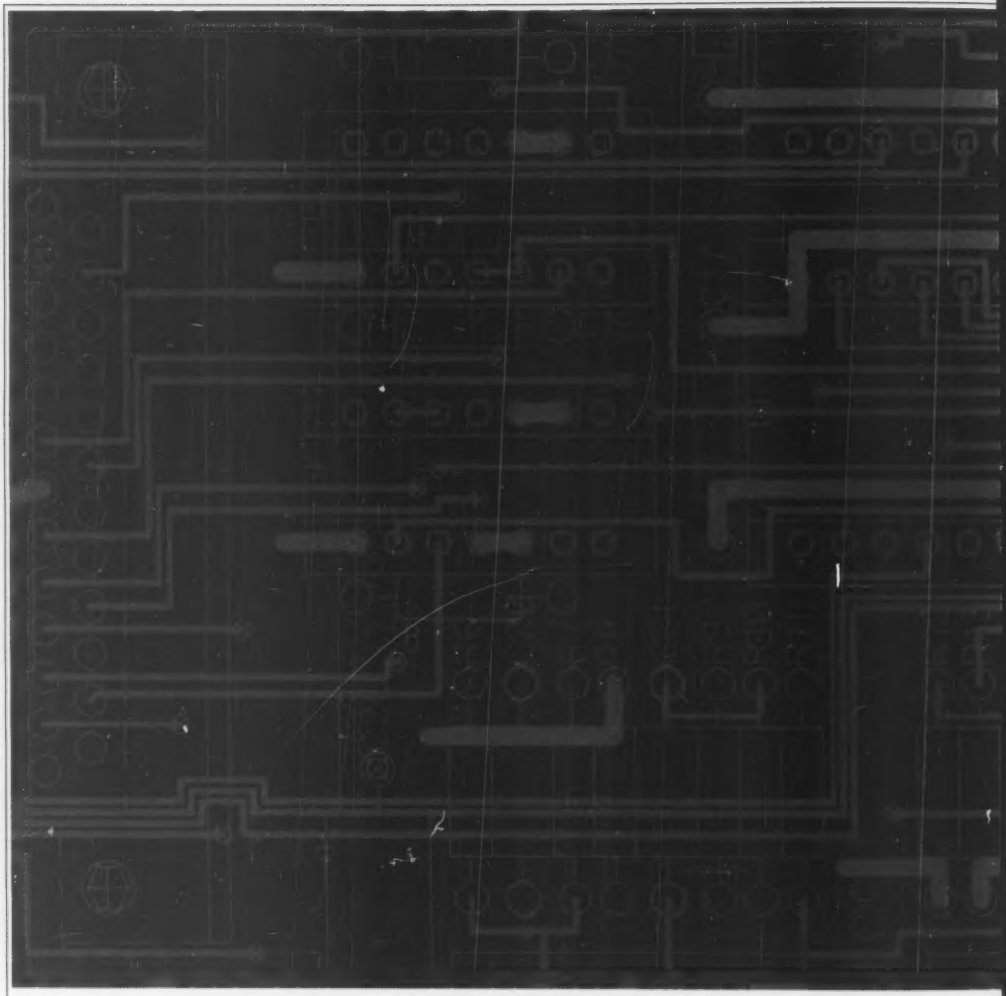
The company also introduced a PC-based ISDN protocol analyzer called TelScope, which reportedly troubleshoots and analyzes ISDN networks that support the BRI connection.

Troubleshooter

A similar product was announced by Tekelec, based in Calabasas, Calif. Its portable ISDN protocol tester, the Chameleon 20-I, is said to monitor both BRI and PRI channels. The device is intended for use by field service personnel responsible for network troubleshooting.

Also at the TCA, Teleos Communications, Inc. in Eatontown, N.J., announced that its B10PC ISDN Communications Coprocessor now allows a wide variety of hosts and workstations to communicate over the BRI ISDN link, using Crosstalk Mk.4 software. Developed by Digital Communications Associates, Inc., a subsidiary of Crosstalk Communications Co., Mk.4 is said to support file transfer and emulation of more than 20 terminals.

Finally, Advanced Micro Devices, Inc. in Sunnyvale, Calif., introduced a software development kit for ISDN terminal equipment designers, claiming it can save man-years of research effort and help developers bring products to market six to 12 months earlier than otherwise possible. The turnkey package reportedly offers a complete ISDN system through layer three of the Open Systems Interconnect model for terminals. It complies with AT&T's BRI specification.



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Homeless

CONTINUED FROM PAGE 73

The program relies on three network facilitators to keep the bulletin board up to date.

Although the Handsnet network is essentially a community listing service, "we are not just a messy bulletin board," said Handsnet's network administrator, Chris Williams. "We never just put up useless information for the sake of filling the service."

Handsnet's Foodnet and Shelternet categories, for example, are filled with information on surplus food and housing.

"Occasionally our food bank receives a call from the frozen-food industry," said Sam Karp, who heads Handsnet. "'We have 200,000 pounds of frozen broccoli. Can you take it within 38 hours?' they might ask."

Within minutes, that information goes across the Handsnet network. With a few taps on the keyboard, clients of an agency with empty cupboards this morning may be sipping broccoli soup tonight.

Handsnet's Karp

The Public Policy section, on the other hand, keeps users aware of impending and relevant legislation. Through Handsnet, the Legal Aid Foundation of Los Angeles was able to sound the alarm when a state bill that provided money for homeless shelters was being stonewalled by the Reagan administration. Legal Aid quickly used the network to collect affidavits from homeless families to bolster its case and filed suit. In the end, the administration relented.

Handsnet was fueled last year with a $140,000 Hands Across America grant but really took off in December when Apple Computer, Inc. kicked in $250,000 worth of computers, printers and modems. The system is built around a network of Macintosh SEs equipped with hard disks. Copies of Microsoft Corp.'s Works and training packages from Layered, Inc. were donated.

Although Handsnet originally began working on the Applelink network, it recently switched to Connect, Inc.'s Connect Information Service so it could facilitate non-Apple product integration.

Handsnet's central database is now stored on Connect's mainframes in Cupertino, Calif., and users log into the service with a telephone call.

First-time users are given a three-day get-acquainted training session. Subscribers then pay $25 a month to belong.

Handsnet has been so successful since its launch that plans are already afoot to link up more national networks.

"We ultimately want to expand this nationally," said Karp, who added that he would like to have 1,000 subscribers within three years.

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MOTOROLA INC.

T1 net analysis, design tools debut

BY ELISABETH HORWITT
CW STAFF

Make, Inc. has introduced what it claims are the first commercially available analysis and design tools for T1 networks. The first version of Netool Workbench, which reportedly can be tailored to any vendor's T1 product line, will be marketed by Network Equipment Technologies, Inc. (NET).

The workbench can be used either to design a network from scratch or to test out the impact of proposed changes and reconfigurations on an existing network without actually implementing them, said NET spokeswoman Sheila Sandow. "We and Timeplex both recently announced network design and planning services, but this allows customers to do it on their premises."

The workbench was designed to complement existing network monitoring and troubleshooting tools offered by T1 vendors, according to Make President Stephen Howard. A set of integrated tools available for Netool Workbench includes the following:

- Network Graphics Tool, which provides color views of the network, including topology and performance information such as circuit routings and link loadings.
- Failure Analysis Tool, which can test failure conditions across single T1 trunks, links, nodes and whole regions.
- Topology Design Tool, which builds T1 network topologies to meet specified circuit requirements and network constraints.
- Tariff Access and Query Tool, which provides access to current industry transmission tariffs for use by the other tools.

To save the user from having to constantly load the latest network topology and configuration specifications into the workbench, the product is said to collect this information directly from the T1 vendor's network management database, Howard said. Make also provides updated network tariff information for the product.

The system is said to accurately simulate network response under a variety of conditions as well as vendor-specific devices at a fairly low level, according to Howard.

The NET version is scheduled to ship in the first quarter of next year. Pricing information is not available.

This is for everyone around the idea of ch

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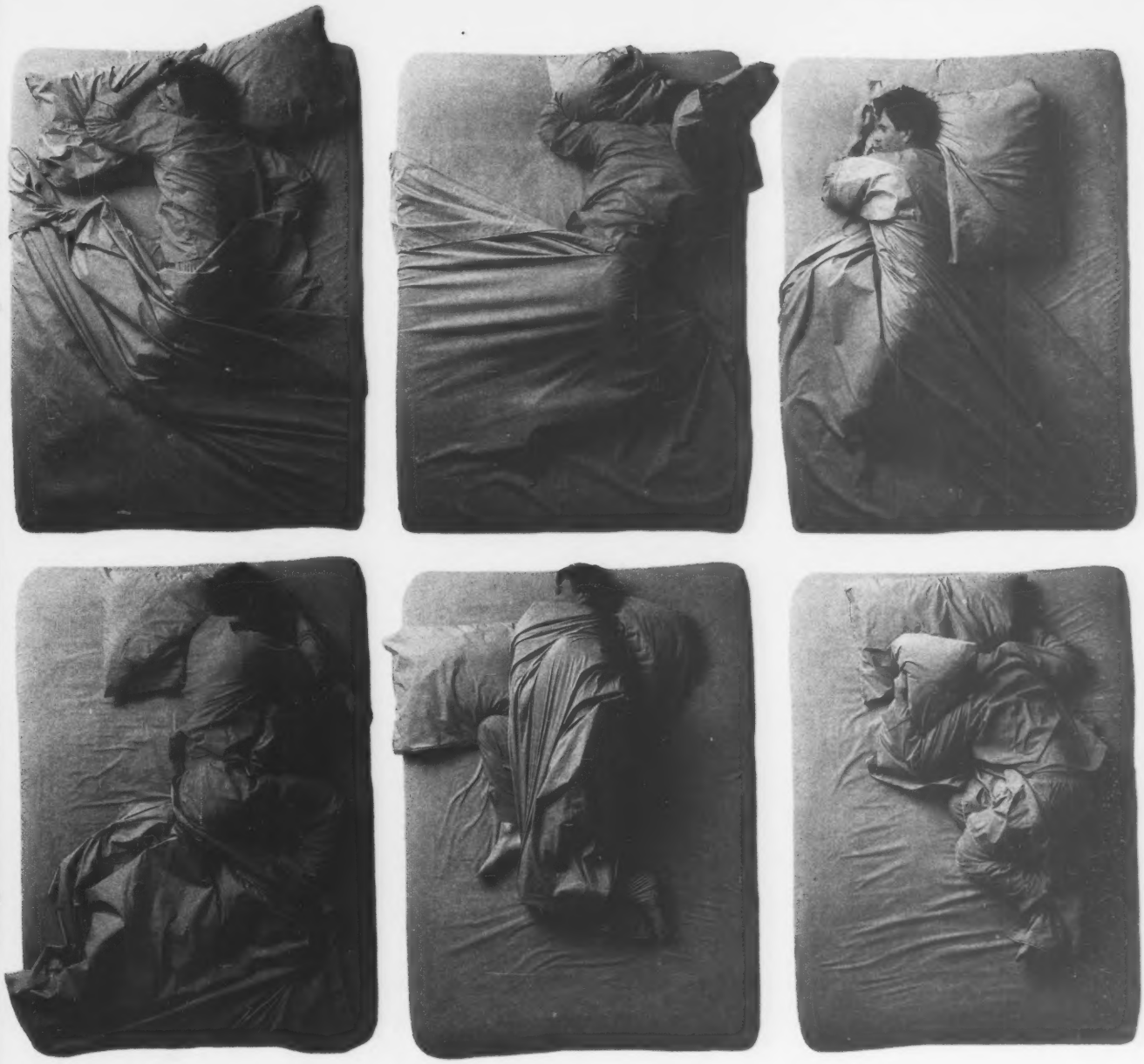

who's been tossing anging their network.

And as if that isn't enough, our parent company is Motorola, one of the most highly regarded electronics corporations in the world.

The point being, nobody understands networking the way Codex understands networking.

To find out how much we know, call **1-800-426-1212, ext. 7214,** or write us at Codex Corporation, Department 707-214, Maresfield Farm, 7 Blue Hill River Road, Canton, Massachusetts 02021-1097.

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Mr. Robert C. Seate
Manager, Management Information Systems
Best Western International, Inc.

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Novell

CONTINUED FROM PAGE 73

items were detailed:

- Shipments have begun of the previously announced Netware Requestor for OS/2, which enables OS/2 workstations to run on Novell networks and is compatible with OS/2 Extended Edition 1.0, and Netware for VMS, which allows Netware networks to share data, print services and applications with Digital Equipment Corp. VAX computers.
- The Novell Software Group was unveiled, composed of three divisions: Netware Products (NPD), Communications Products (CPD) and Development Products (DPD). Headed up by Executive Vice-President Craig Burton, the group includes: Mark Caulkins, marketing vice-president; and Nancy Woodward, Richard King and Darrell Miller as vice-presidents and general managers, respectively, of DPD, NPD and CPD.
- Six services debuted under the Novell Independent Manufacturer Support Program: independent product testing, hardware design consultation, hardware manufacturing engineering support, interoperability certification, technical training, education and support and marketing programs.
- An enhanced version of Novell's Technical Information Database, which is an on-line source for product and technical information on Netware that the vendor is offering as an option for the Netware Pro service and training kit.
- The launch of the Netware Technical Journal, a quarterly publication to be written for developers of Netware-compatible applications. A year's subscription is $60, and a two-year subscription costs $90.

NETWORLD 88

Third-party vendors exhibiting at the show made up the bulk of the announcements. Proteon, Inc. in Westboro, Mass., demonstrated an IBM Micro Channel Architecture (MCA) interface for its Pronet-4 and a Pronet-10 fiber-optics system. The P1840 MCA interface supports IBM's Programmable Option Select software. It reportedly allows users to combine the IBM Personal System/2's high-capacity memory and graphics with Pronet's 4M bit/sec. throughput for high-speed bulk data transactions, graphic image transfers and software development. It costs $830.

Fault tolerance is a key attribute of fiber-optic support for the Pronet-10. The product family includes the P2617 Fiber Center, which supports eight fiber nodes and can be linked to a Pronet-10 ring; the P1307 IBM Personal Computer Fiber Interface adapter, which plugs into IBM PCs or compatibles to allow direct connection of fiber cable; and the P3000 Series Fiber Links, which enables integration of fiber cable into existing networks, the vendor claimed. Pricing is $3,700, $1,200 and $1,450, respectively.

NOVELL'S ONE major announcement — a strategic distribution and technology transfer agreement with Ashton-Tate Corp. — was canceled, but a number of minor items were detailed.

Gateway Communications, Inc. in Irvine, Calif., announced Advanced Netware and SFT Netware V2.12 support on all its wide-area networking products at no additional cost.

Microserve, Inc. unveiled a product family said to allow Apple Computer, Inc.'s Macintosh to run Microsoft Corp.'s MS-DOS applications under Netware. Novell's Netware V2.15 will link only Macintoshes running Mac applications, according to Microserve. Macnode reportedly enables users to print to network or local printers, multitask under Apple's Multifinder, transfer files and update a PC window while running in background mode.

Crystal Point, Inc. in Kirkland, Wash., introduced Yak, which it claimed is the first multiuser bulletin board for local-area networks. Yak runs on a dedicated server and reportedly allows as many as 16 users to simultaneously read or enter both public and private messages.

BIT BLAST

Vendors connect with ISDN pacts

AT&T Technologies, Inc. has agreed to implement **Datagraf, Inc.'s** protocol conversion technology over Integrated Services Digital Network (ISDN) systems. Datagraf reportedly provides more than 90 protocol conversion tools for transmitting data over ISDN. AT&T will have exclusive rights to market the products to the federal government under the deal, with deliveries scheduled to begin this quarter.

Southwestern Bell Telephone Co. and **Touch Communications, Inc.** said they will merge Touch's Open Systems Interconnect (OSI) end-user products with Southwestern Bell's ISDN offerings, reportedly enabling OSI systems to communicate over ISDN links.

Continued on page 84

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TCP/IP laggards make debut

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — The recent Interop 88 conference has gotten a lot of ink for its emphasis on migration paths between current bridging favorite Transmission Control Protocol/Internet Protocol (TCP/IP) and the still incomplete Open Systems Interconnect (OSI) architecture. But the network show also highlighted the strategies of two significant latecomers to the TCP/IP party.

After a year of promises, Apple Computer, Inc. still managed to disappoint users expecting either an off-the-shelf product or immediate availability. Instead, it announced MacTCP, a developer's tool for enabling Macintosh computers to operate and share information with other systems using the TCP/IP protocols. It is set to ship in the first quarter next year.

However, Apple's TCP/IP support is a continuation of a significant effort during the last 12 months to link "the computer for the rest of us" to the rest of the world.

MacTCP runs on any Mac over both Ethernet and Apple Localtalk-compatible cabling systems. It will be site-licensed to third parties for use in application developments such as electronic mail, virtual terminal, file transfer, database access and distributed applications.

Apple said key features include the following: support for concurrent multiple TCP/IP services; co-residence with Appletalk network protocols to preserve full access to Appletalk service; the ability to acquire network addresses dynamically,

INTEROP 88

reportedly enabling plug-and-TCP/IP networking; and use of the Macintosh Control Panel to simplify address configuration for network administrators.

MacTCP is said to be a full implementation of the TCP/IP protocol suite. An internal-use license costs $2,500; a commercial license is an additional $2,500.

Although Apple declined to say so, Ungermann-Bass, Inc., which also belatedly unveiled TCP/IP support, co-developed the Apple product. That is why, as Apple pointed out in its release, UB is the first vendor to have developed a set of commercially supported end-user applications using MacTCP.

UB announced Net/One TCP-Mac — featuring file transfer, virtual terminal and E-mail — along with TCP/IP support for Net/One systems.

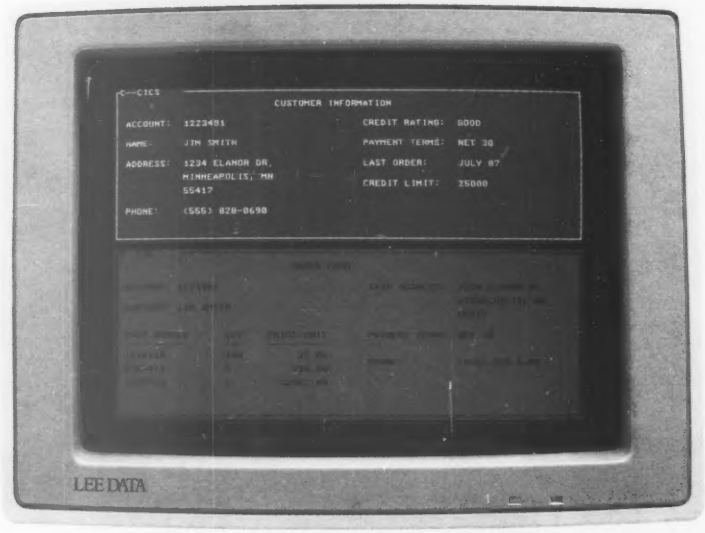
The Net/One TCP product family also includes TCP-PC and Network Management Console (NMC) software. These components are said to provide universal host connectivity; terminal emulation, including the Telnet virtual terminal protocol; and high-speed file transfers over local- and wide-area networks. Users retain access to all Net/One capabilities and products, including support for data link bridges and a variety of cabling schemes.

NMC is sold on a per-network basis for $5,000. TCP-PC is licensed on a per-workstation basis for personal computers and IBM Personal System/2s at $250; TCP-Mac also costs $250 per license.

A longtime OSI market leader, Hewlett-Packard Co. said it will extend its HP Openview network management to also manage TCP/IP networks by 1989.

Using an HP 9000, HP said it coupled software based on the emerging OSI standard, Common Management Information Services and Protocol, with its HP Arpa Services software to communicate with a central network management console managing any TCP/IP networks.

A display of brilliance.



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API	X	X
Multiple Async Sessions	X	
80286 Processor	X	
MS-DOS Support	X	
Mods 2-5	X	X
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Hard Disk Option	X	

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Bit blast

CONTINUED FROM PAGE 83

Set to be available later this fall, **Gandalf Data, Inc.** and **Hewlett-Packard Co.** will jointly offer network support services to their mutual customers.

The **Corporation for Open Systems** and the European-based **Standards Promotion and Application Group** have agreed to merge their conformance tests for international standards. They also will be marketing each other's testers.

Acer Technologies Corp. signed a one-year, $4 million OEM pact with **Novell, Inc.** The deal extends a previous agreement enabling Acer to bundle Novell's Advanced Netware on Acer's Intel Corp. 80386-based Acerserver 5200.

Excelan, Inc. in San Jose, Calif., has agreed to start marketing **TGV, Inc.'s** Multinet, which provides Transmission Control Protocol/Internet Protocol support for Digital Equipment Corp.'s VAX/VMS environment.

Allen-Bradley Co.'s Communications Division will resell **Chipcom Corp.'s** broadband Ethernet local-area network products as part of its LAN/3 line under an initial 15-month OEM agreement.

Atlantic Research Corp. (ARC) and **Vance Systems, Inc.** have agreed to jointly develop test, analysis and network management products for fully integrated local-area and wide-area networks. Also, ARC is now offering Vance's token-ring test equipment.

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  - ☐ Cyber 930
  - ☐ Cyber 960
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Hitachi
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  - ☐ M 220
  - ☐ M 240
  - ☐ M 630
  - ☐ M 640
  - ☐ M 660
  - ☐ M 680

Honeywell Bull
- ☐ DPS 7000 Series
  - ☐ 7000/10
  - ☐ 7000/20
  - ☐ 7000/30
  - ☐ 7000/40
  - ☐ 7000/50
  - ☐ 7000/72
  - ☐ 7000/82
  - ☐ 7000/92
- ☐ DPS 8
  - ☐ 52
  - ☐ 62
  - ☐ 70
- ☐ DPS 8000 Series
  - ☐ 8000/41
  - ☐ 8000/81
  - ☐ 8000/82
  - ☐ 8000/83
  - ☐ 8000/84
- ☐ DPS 88 Series
  - ☐ 41
  - ☐ 42
  - ☐ 81
  - ☐ 82
  - ☐ 861
  - ☐ 862
  - ☐ 891
  - ☐ 892
- ☐ DPS 90 Series
  - ☐ 91
  - ☐ 92
  - ☐ 93
  - ☐ 94

IBM
- ☐ 370 Family
- ☐ 308X Family
- ☐ 3090 Family
  - ☐ 3090 Model 120E
  - ☐ 3090 Model 150E
  - ☐ 3090 Model 180E
  - ☐ 3090 Model 200E
  - ☐ 3090 Model 300E
  - ☐ 3090 Model 400E
  - ☐ 3090 Model 600E
- ☐ 4381 Family
  - ☐ 4381 Model Group 11
  - ☐ 4381 Model Group 12
  - ☐ 4381 Model Group 13
  - ☐ 4381 Model Group 14
  - ☐ 4381 Model Group 21
  - ☐ 4381 Model Group 22
  - ☐ 4381 Model Group 23
  - ☐ 4381 Model Group 24
- ☐ 5360 System Unit
- ☐ 5362 System Unit
- ☐ 5363 System Unit
- ☐ 9370 Family
  - ☐ 9373 Model 20
  - ☐ 9375 Model 40
  - ☐ 9375 Model 60
  - ☐ 9375 Model 90

NAS
- ☐ NAS AS/VL Series
  - ☐ AS/VL 40
  - ☐ AS/VL 50
  - ☐ AS/VL 60
  - ☐ AS/VL 80
- ☐ NAS AS/XL Series
  - ☐ AS/XL 50
  - ☐ AS/XL 60
  - ☐ AS/XL 70
  - ☐ AS/XL 80
  - ☐ AS/XL 90
  - ☐ AS/XL 100

NCR
- ☐ NCR I Series
  - ☐ I-9400
  - ☐ I-9500
- ☐ NCR V Series
  - ☐ V-8600 Series
  - ☐ V-8800 Series
- ☐ NCR System 10000 Family
  - ☐ Model 35
  - ☐ Model 55
  - ☐ Model 65
- ☐ Model 75
- ☐ NCR 9800 Series
  - ☐ 9811
  - ☐ 9821
  - ☐ 9822
  - ☐ 9832
  - ☐ 9842
  - ☐ 9844
  - ☐ 9863

Nixdorf
- ☐ 8890

Siemens
- ☐ 7000

Tandem
- ☐ VLX

Unisys

Sperry
- ☐ 1100 Family
  - ☐ 1100/91
  - ☐ 1100/92
  - ☐ 1100/93
  - ☐ 1100/94
  - ☐ 1100/71
  - ☐ 1100/72
  - ☐ 1100/73
  - ☐ 1100/74
- ☐ 2200 Family
  - ☐ 2200/201
  - ☐ 2200/202
  - ☐ 2200/203
  - ☐ 2200/204
  - ☐ 2200/401
  - ☐ 2200/402
  - ☐ 2200/403
  - ☐ 2200/404

Burroughs
- ☐ A Series
  - ☐ A1
  - ☐ A2
  - ☐ A3
  - ☐ A4

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- ☐ ACER 900
- ☐ ACER 900/12
- ☐ ACER 910
- ☐ ACER 1030
- ☐ ACER 1100

Alcatel
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- ☐ XTRA Pro. Series 400 Workstation
- ☐ XTRA Pro. Series 700 Workstation

Altos
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- ☐ 686
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- ☐ 2086
- ☐ Series 1000
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AMDEX
- ☐ System/88
- ☐ System/286
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- ☐ System/386
- ☐ System/386E

Amstrad
- ☐ PPC 512
- ☐ PPC 640
- ☐ PC 1512
- ☐ PC 1640

Apollo
- ☐ DN 10000 Series
- ☐ DN 300 Series
  - ☐ DN 300
  - ☐ DN 320
  - ☐ DN 330
- ☐ DN 3000 Series
  - ☐ DN 3000
  - ☐ DN 3010
  - ☐ DN 3050
- ☐ DN 400 Series
  - ☐ DN 400
  - ☐ DN 420
  - ☐ DN 460
- ☐ DN 4000 Series
- ☐ DN 5XX Series
  - ☐ DN 550
  - ☐ DN 560
  - ☐ DN 570
  - ☐ DN 570 Turbo
  - ☐ DN 580
  - ☐ DN 580 Turbo
  - ☐ DN 590
  - ☐ DN 590 Turbo
- ☐ DN 600 Series
  - ☐ DN 600
  - ☐ DN 660
- ☐ DSP-80
- ☐ DSP-90

Apple
- ☐ Macintosh 512
- ☐ Macintosh 512K E
- ☐ Macintosh Plus
- ☐ Macintosh SE
- ☐ Macintosh II

AST
- ☐ Premium/286
- ☐ Premium/386
- ☐ Premium Workstation
  - ☐ Model 200
  - ☐ Model 203
  - ☐ Model 205
  - ☐ Model 243

AT&T
- ☐ 6286 WGS
- ☐ 6300 WGS
- ☐ 6300 + WGS
- ☐ 6312 WGS
- ☐ 6386 WGS
- ☐ 6386E WGS

Businessland
- ☐ Wyse 386
- ☐ Wyse 286

Canon
- ☐ A-200SX
- ☐ A-200EX II
- ☐ A-200 III

Compaq
- ☐ Deskpro 286
- ☐ Deskpro 386
- ☐ Deskpro 386/20
- ☐ Deskpro 386/25
- ☐ Deskpro Model 2
- ☐ Plus
- ☐ Portable 386
- ☐ Portable II
  - ☐ Model 2
  - ☐ Model 4
- ☐ Portable III
  - ☐ Model 20
  - ☐ Model 40

Computerland
- ☐ BC80
- ☐ BC286

Computervision
- ☐ 30M
- ☐ 32
- ☐ 33
- ☐ 34

Cordata
- ☐ ATD Series
- ☐ ATP Series
- ☐ CS 45
- ☐ CS 4200
  - ☐ CS 4205
  - ☐ CS 4210
  - ☐ CS 4220
- ☐ CS 5000 Series
  - ☐ CS 5005
  - ☐ CS 5040
  - ☐ CS 5080
- ☐ WPC
- ☐ WPC Bridge

Data General
- ☐ Dasher/286
- ☐ DG/One Model 2T

Datavue
- ☐ DV 2502
- ☐ DV 2503
- ☐ DV 2504
- ☐ DV 2300 Series
  - ☐ DV 25-2302FL
  - ☐ DV 25-2303FL
  - ☐ DV 25-2304FL
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  - ☐ DV 25-2403
  - ☐ DV 25-2404
- ☐ Snap 1+1
  - ☐ Model 01
  - ☐ Model 01EL
  - ☐ Model 01GL
- ☐ Spark
  - ☐ Model 3841
  - ☐ Model 3842
  - ☐ Model 6401
  - ☐ Model 6402

Dell
- ☐ PC's Limited Turbo
- ☐ Dell System 200
- ☐ Dell System 220
- ☐ Dell System 310

Digital Equipment Corp.
- ☐ VAXmate
- ☐ PC500

Epson
- ☐ Equity I+
- ☐ Equity II+
- ☐ Equity LT
- ☐ Equity III+

Ericsson
See Nokia Data

Esprit
- ☐ Esprit I
- ☐ Esprit II
- ☐ Esprit III
- ☐ Esprit 6000 Series
- ☐ Esprit Opus 3ml

Everex
- ☐ Step 80286
  - ☐ 286/12
  - ☐ 286/16
- ☐ Step 80386
  - ☐ 386/16
  - ☐ 386/20

Franklin
- ☐ PC-8000
- ☐ PC-8000

Grid
- ☐ GRIDCase 2.3
  - ☐ Model 1250
  - ☐ Model 1252
  - ☐ Model 1260
- ☐ GRIDCase Plus 2.3
- ☐ GRIDCase 1530

Hewlett-Packard
- ☐ HP 250XX
- ☐ HP Vectra
  - ☐ Model 25
  - ☐ Model 45
  - ☐ Model 50
  - ☐ Model 60
- ☐ HP Portable Plus
  - ☐ Model 45711F
  - ☐ Model 45711E
- ☐ HP Portable Vectra CS
  - ☐ Vectra CS
  - ☐ Vectra CS Model 20
- ☐ HP Vectra CS PC
  - ☐ Model 10
  - ☐ Model 11
  - ☐ Model 12
  - ☐ Model 20
- ☐ HP Vectra ES PC
  - ☐ Model 10
  - ☐ Model 20
  - ☐ Model 21
  - ☐ Model 22
- ☐ HP Vectra ES/12 PC
  - ☐ Model 10
  - ☐ Model 20
  - ☐ Model 40
- ☐ HP Vectra RS/16 PC
- ☐ Model 1253
- ☐ Model 1263
- ☐ GRIDCase EXP
  - ☐ Model 1255
  - ☐ Model 1265
- ☐ GRIDLite
- ☐ GRIDLite Plus
- ☐ GRIDCase 1520

Intergraph
- ☐ InterPro
- ☐ InterAct
- ☐ InterView

Kaypro
- ☐ Kaypro Micro I
- ☐ Kaypro PC
  - ☐ Kaypro PC-30
  - ☐ Kaypro 286
  - ☐ Kaypro 286i
  - ☐ Model A
  - ☐ Model C
- ☐ Kaypro 286-16
- ☐ Kaypro 386 Series
  - ☐ Model A
  - ☐ Model E-40
- ☐ Kaypro 2000+

Leading Edge
- ☐ Leading Edge PC, Model D
- ☐ Leading Edge PC, Model D2
- ☐ Leading Edge Model MH

Mitac
- ☐ Paragon III
- ☐ Paragon 286
- ☐ Paragon 286S
- ☐ Paragon 286V
- ☐ Paragon 286VE
- ☐ Paragon 386
- ☐ Paragon 386E

Mitsubishi
- ☐ MP 286 Series
  - ☐ Model 310
  - ☐ Model 320
  - ☐ Model 340
- ☐ MP 386

NCR
- ☐ PC8
- ☐ PC710
- ☐ PC810
- ☐ PC916
- ☐ 3390
- ☐ 3392

NEC
- ☐ PowerMate I
  - ☐ H200-1B
  - ☐ H201-1B
  - ☐ H202-1B
  - ☐ H203-1B
- ☐ PowerMate 2
  - ☐ Model H500B
  - ☐ Model H501B
  - ☐ Model H502B
  - ☐ Model H503B
- ☐ Model 40
- ☐ HP Vectra RS/20 PC
  - ☐ Model 40
  - ☐ Model 100
  - ☐ Model 150
  - ☐ Model 300

Honeywell Bull
- ☐ PC AP-X Series
- ☐ PC XP Series
- ☐ PC SP Series

Hyundai
- ☐ Super-16T
- ☐ Super-286
- ☐ Super-286C

IBM
- ☐ PC Convertible
- ☐ PC XT
- ☐ PC AT
- ☐ PC
- ☐ PC XT 286
- ☐ PS/2 Model 25
- ☐ PS/2 Model 30
- ☐ PS/2 Model 50
- ☐ PS/2 Model 60
- ☐ PS/2 Model 70
- ☐ PS/2 Model 80
- ☐ 3151 ASCII Display Station
- ☐ 3161 ASCII Display Station
- ☐ 3162 ASCII Display Station
- ☐ 3163 ASCII Display Station
- ☐ 3164 ASCII Display Station

Nokia Data
- ☐ Nokia PC286
- ☐ Nokia WS286
- ☐ Nokia TT/286
- ☐ Nokia WS386
- ☐ Nokia TT/386

Olivetti
- ☐ M280
- ☐ M240
- ☐ M250
- ☐ M290
- ☐ M380 Family
- ☐ M380XP Family

PC's Limited
See Dell
- ☐ PC's Limited 286

Samsung
- ☐ S300
- ☐ S500
- ☐ S5000
- ☐ S5100

Sharp
- ☐ PC-4500 Series
  - ☐ Model 4501
  - ☐ Model 4502
  - ☐ Model 4521
- ☐ PC-7000A/7000 Series
  - ☐ Model 7000A
  - ☐ Model 7100
- ☐ PC-7200 Series
  - ☐ Model 7202
  - ☐ Model 7221
  - ☐ Model 7241

Sun
- ☐ Sun 4/100 Family
- ☐ Sun 4/200 Family
- ☐ Sun 3/50
- ☐ Sun 3/60
- ☐ Sun 3/100 Family
- ☐ Sun 3/200 Family
- ☐ Sun386i Family

Tandon
- ☐ PCX
  - ☐ Model PCX-2
  - ☐ Model PCX-20
- ☐ PCA
  - ☐ Model PCA-1
  - ☐ Model PCA-20
  - ☐ Model PCA-40
  - ☐ Model PCA-70
- ☐ PCA Plus
  - ☐ Model PCA-20 Plus
  - ☐ Model PCA-40 Plus
  - ☐ Model PCA-70 Plus

Targa
- ☐ Targa 20
- ☐ Targa 40

Targa Plus
- ☐ Targa 20 Plus
- ☐ Targa 40 Plus

- ☐ PAC 286
- ☐ PAC 286 Plus
- ☐ 386

Tandy
- ☐ Model 1000SL
- ☐ Model 1000TL
- ☐ Model 1000TX
- ☐ Model 1400LT
- ☐ Model 3000
- ☐ Model 3000HL
- ☐ Model 3000NL
- ☐ Model 4000
- ☐ Model 4000LX

Tatung
- ☐ TCS-4000
- ☐ TCS-7000
- ☐ TCS-8000

TeleVideo
- ☐ Telecat 286
  - ☐ Model FL
  - ☐ Model 101
  - ☐ Model 40
  - ☐ Model ND
- ☐ Tele/386
  - ☐ Model NH
  - ☐ Model 40
- ☐ TeleOAS I
- ☐ TeleOAS II
  - ☐ Model NH
  - ☐ Model 20
- ☐ TeleOAS III
  - ☐ Model NH
  - ☐ Model 40
  - ☐ Model 70
- ☐ TeleOAS III/20
  - ☐ Model NH
  - ☐ Model 40
  - ☐ Model 70
- ☐ TeleVideo 9xx Family

Texas Instruments
- ☐ Business Pro

Toshiba
- ☐ T1000
- ☐ T1100 Plus
- ☐ T1200
- ☐ T3100/20
- ☐ T3200
- ☐ TS100

Unisys
- ☐ PW2
- ☐ Series 300
- ☐ Series 500
- ☐ Series 800
  - ☐ 800/16
  - ☐ 800/20
- ☐ Series 850

Victor Technologies
- ☐ VPS IIe
  - ☐ 2691M-1
  - ☐ 2692M-1
  - ☐ 2693C-1
- ☐ VPC 250
  - ☐ 2721M-1
  - ☐ 2721C-1
  - ☐ 2722M-1
  - ☐ 2722C-1

Wang
- ☐ Laptop Computer
- ☐ PC 240
  - ☐ PC 240-1
  - ☐ PC 240-2
  - ☐ PC 240-3
- ☐ PC 280
  - ☐ Model PC 280-1
  - ☐ Model PC 280-2
  - ☐ Model PC 280-3
- ☐ PC 380
  - ☐ Model PC 380-1
  - ☐ Model PC 380-2
  - ☐ Model PC 380-3

Wyse
- ☐ PC 286 Model 2108
- ☐ PC 286 Model 2112
- ☐ PC 286 Model 2200
- ☐ PC 286 Model 2214
- ☐ PC 386 Model 3216
- ☐ Wyse 30
- ☐ Wyse 50
- ☐ Wyse 60

Zenith
- ☐ Z-159
  - ☐ Model 2
  - ☐ Model 3
  - ☐ Model 12
  - ☐ Model 13
- ☐ Z-248
  - ☐ ZF-248-81
  - ☐ ZF-248-82
  - ☐ ZF-248-84
- ☐ Z-286
  - ☐ ZE-286-02
  - ☐ ZF-286-23
  - ☐ ZF-286-25
- ☐ Z-386
  - ☐ Model 40
  - ☐ Model 80

MINICOMPUTERS

AT&T
- ☐ 3B Series

Data General
- ☐ ECLIPSE MV/Family
  - ☐ MV/1400 DC
  - ☐ MV/2000 DC
  - ☐ MV/7800 DCX
  - ☐ MV/2000 DC
  - ☐ MV/7800 XP
  - ☐ MV/15000
    - ☐ Model 8
    - ☐ Model 10
    - ☐ Model 20
  - ☐ MV/20000
    - ☐ Model 1
    - ☐ Model 2

Digital Equipment Corp.
- ☐ DEC MicroVAX 2000
- ☐ DEC MicroVAX 3500
- ☐ DEC MicroVAX 3600
- ☐ DEC MicroVAX II
- ☐ DEC VAX 6200
- ☐ DEC VAX 6210
- ☐ DEC VAX 6220
- ☐ DEC VAX 6230
- ☐ DEC VAX 6240
- ☐ DEC VAX 8250
- ☐ DEC VAX 8350
- ☐ DEC VAX 8530
- ☐ DEC VAX 8550
- ☐ DEC VAX 8700
- ☐ DEC VAX 8800 Series
  - ☐ DEC VAX 8810
  - ☐ DEC VAX 8820
  - ☐ DEC VAX 8830
  - ☐ DEC VAX 8840
  - ☐ DEC VAX 8842
- ☐ DEC VAX 8974
- ☐ DEC VAX 8978
- ☐ DEC VAX 11/700 Series
  - ☐ DEC VAX 11/725
  - ☐ DEC VAX 11/730
  - ☐ DEC VAX 11/750
  - ☐ DEC VAX 11/780
  - ☐ DEC VAX 11/785

Gould
- ☐ MPX

Harris
- ☐ H Series
  - ☐ H100
  - ☐ H500
  - ☐ H700
  - ☐ H800
  - ☐ H900
  - ☐ H1000
  - ☐ H1200
  - ☐ H1500
  - ☐ H1600
- ☐ Harris HCX5
- ☐ Harris HCX5
- ☐ Harris HCX7
- ☐ Harris HCX9

Hewlett-Packard
- ☐ HP 3000 Family
  - ☐ Micro 3000 LX
  - ☐ Micro 3000 GX
  - ☐ Micro 3000 XE
  - ☐ Series 70
  - ☐ Series 925
  - ☐ Series 925 LX
  - ☐ Series 935
  - ☐ Series 950
  - ☐ Series 955
- ☐ HP 9000 Family
  - ☐ Model 319
  - ☐ Model 320
  - ☐ Model 330
  - ☐ Model 350
  - ☐ Model 360
  - ☐ Model 825
  - ☐ Model 835
  - ☐ Model 840
  - ☐ Model 850
  - ☐ Model 855

Honeywell Bull
- ☐ DPS 6+
  - ☐ 200 Series
    - ☐ Model 200
  - ☐ 210 Series
    - ☐ Model 211
  - ☐ 220 Series
    - ☐ Model 221
  - ☐ 400 Series
    - ☐ Model 402
    - ☐ Model 403
    - ☐ Model 404
  - ☐ 490 Series
    - ☐ Model 412
    - ☐ Model 413
    - ☐ Model 414
  - ☐ 420 Series
    - ☐ Model 422
    - ☐ Model 423
    - ☐ Model 424
- ☐ XPS 100 Series
  - ☐ XI35
  - ☐ X22
  - ☐ X42

IBM
- ☐ Application System/400
- ☐ Series 1
- ☐ System/36
- ☐ System/38
- ☐ System/88
  - ☐ 4575 Processor Model 20B
  - ☐ 4576 Processor Model 40
  - ☐ 4576 Processor Model 50
  - ☐ 4576 Processor Model 60
  - ☐ 4576 Processor Model 61
  - ☐ 4576 Processor Model 62
  - ☐ 4576 Processor Model 63
  - ☐ 4576 Processor Model 64
  - ☐ 4576 Processor Model 85
  - ☐ 4576 Processor Model 86

ICL
- ☐ DRS 300
- ☐ CLAN

Intergraph
- ☐ 200
- ☐ 250
- ☐ 252
- ☐ 350
- ☐ Micro II

NCR
- ☐ Tower Family
  - ☐ NCR mini/Tower
  - ☐ NCR Tower Series
    - ☐ 32/200
    - ☐ 32/400
    - ☐ 32/450
    - ☐ 32/600
    - ☐ 32/650
    - ☐ 32/800
    - ☐ 32/850

Nixdorf
- ☐ Targon Family

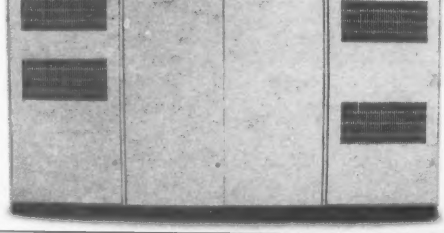
Olivetti
- ☐ LSX 3000 Series

Prime
- ☐ 386 EXL Series
  - ☐ EXL 316
  - ☐ EXL 320
  - ☐ EXL 325
- ☐ 50 Series
  - ☐ Tower Systems
    - ☐ Model 2350
    - ☐ Model 2450
    - ☐ Model 2455
  - ☐ 4000 System
    - ☐ Model 4050
    - ☐ Model 4150
    - ☐ Model 4450
  - ☐ 6000 System
    - ☐ Model 6150
  - ☐ Model 6350
  - ☐ Model 6550

Tandem
- ☐ NON-STOP II
- ☐ TXP
- ☐ CLX

Unisys
- ☐ 5000 Series
  - ☐ 5000/25
  - ☐ 5000/55
  - ☐ 5000/85
  - ☐ 5000/95
- ☐ 6000 Series
  - ☐ 6000/50
- ☐ 7000 Series
  - ☐ 7000/30
  - ☐ 7000/40
  - ☐ 7000/50
  - ☐ 7000/51
  - ☐ 7000/52

Wang
- ☐ VS 5000
- ☐ VS 5400
- ☐ VS 5430
- ☐ VS 5440
- ☐ VS 5450
- ☐ VS 5460
- ☐ VS 5E
- ☐ VS 6E
- ☐ VS 75E
- ☐ VS 7100
- ☐ VS 7110
- ☐ VS 7120
- ☐ VS 7150
- ☐ VS 7330
- ☐ VS 7320
- ☐ VS 5
- ☐ VS 6
- ☐ VS 15
- ☐ VS 25
- ☐ VS 45
- ☐ VS 65
- ☐ VS 85
- ☐ VS 90
- ☐ VS 100



OPERATING SYSTEMS

- ☐ DOS
  - ☐ MS-DOS
  - ☐ PC-DOS
  - ☐ NCR-DOS
- ☐ ProDOS
  - ☐ VectraDOS
  - ☐ OS/2
- ☐ GCOS 7
- ☐ GCOS 8
  - ☐ Macintosh
  - ☐ MVS
- ☐ GCOS 6
- ☐ PRIMOS
- ☐ ULTRIX
- ☐ UNIX
- ☐ VM
- ☐ VMS
- ☐ XENIX

TRANSMISSION MEDIA

- ☐ Broadband
- ☐ Fiber Optic
- ☐ LocalTalk
- ☐ Microwave
- ☐ Public Data Network
- ☐ Satellite
- ☐ T1
- ☐ Thick Ethernet
- ☐ Thin Ethernet
- ☐ Token Ring
- ☐ Twisted Pair

AS YOU'D LIKE.

PERIPHERALS

Boards
- AboveBoard
- High Page
- IBM Token Ring Adapter Card

- Laserwriter
- Laserwriter II NT
- Laserwriter NT
- Laserwriter Plus

AST
- Turbolaser P/S

- ProWriter C715
- ProWriter Jr. +
- StarWriter D10
- Jetwriter Laser

Citizen
- 120-D

- MSP-55
- Premiere 35
- Tribute 124
- Tribute 224

Diablo
- 630 API
- Advantage D25

Epson
- DFX5000
- EX800
- FX1050
- FX286E
- FX850
- LI000
- LQ Series
  - LQ1050
  - LQ2500
  - LQ2550
  - LQ500
  - LQ850
  - LQ950
- LX800
- MX Series
- RX Series

Fujitsu
- RX7100
- RX7200

- RX7300

Hewlett-Packard
- LaserJet
- LaserJet Model 2
- LaserJet 2000
- LaserJet 500+
- LaserJet+
- LaserJet Series II
- ScanJet
- Deskjet
- HP 7475A Plotter
- HP 7550A Plotter

IBM
- ProPrinter

NEC
- LC860
- LC890
- P6 Pinwriter
- P7 Pinwriter
- P5XL Pinwriter
- P72200 Pinwriter

Okidata
- Laserline 6
- Microline 192 Plus
- Microline 193 Plus
- Microline 292
- Microline 293

- Microline 393

Panasonic
- KX-P1080i
- KX-P1091i
- KX-P1092i

Star Micronics
- ND15
- NR10
- NR15
- NX1000
- NX15

Toshiba
- PageLaser
- 321 SL
- 341 SL
- 351 SX
- 351 C-2

Xerox
- Model 8044
- Model 4045
- Model 4075
- Model 4090
- Model 8700
- Model 8790
- Model 9700
- Model 9790

Telecommunications

Amdahl
- 470X Communications Processor
  - 4725
  - 4725E
  - 4745

Digi-Link
- Model DL55TY-01BC

Hayes
- Smartmodem 2400
- Smartmodem 1200
- V Series 9600
- Personal Modem

IBM
- 3720 Communication Controller
- 3721 Expansion Unit

- 3725 Communication Controller Model 1
- 3725 Communication Controller Model 2
- 3726 Communication Control Electric Switch
- 7170 Device Attachment Control Unit (DACU)
- TYTI ASCII Device Attachment Control Unit

- 7426 Terminal Interface Unit
- 7427 Console Switching Unit
- 9736 Integrated Digital Network Exchange Model 20
- 9737 Integrated Digital Network Exchange Model 40
- 9738 Integrated Digital Network Exchange Model 70
- IBM 9751 CBX

Natural Microsystems
- Watson Voice System

Racal-Vadic
- 1200VP
- 1200PA
- 2400VP
- 2400PA Model 2
- 9600VD

Scitex
- Integrator 1544

Telebit Corp.
- Trailblazer Plus

Ven-Tel
- 18-K

Boards
- InBoard 386
- J-Laser Board
- TinyTurbo 286

Printers, Lasers, Scanners

Apple

C. Itoh
- PW 1550S + NLQ
- PW 1850S + NLQ
- ProWriter 315

- 180-D
- MSP-15E
- MSP-40
- MSP-45
- MSP-50

APPLICATION SOFTWARE

- 1-2-3
- 1-2-3 Networker
- 4th Dimension
- Ability
- Access/X.25/SDLC/QLLC
- AccountMate
- AccountMate III Plus
- ACCPAC BPI Accounting
- ACCPAC Plus
- Adobe Illustrator
- Advanced Revelation
- Aerus
- AIMS
- AppleLink
- Application Development System
- ARCnet
- Asynchronous Communications Server
- AutoCAD
- BABY/36
- BBx Progression/2
- Btrieve
- Btrieve/N
- C Language RPC Compiler
- C-ISAM
- Carbon Copy
- Case Management System
- CC-Assist
- CertiFlex
- Champion III
- ChiLan CS-1 UTS Gateway
- CLC
- Clipper
- Close-Up
- Color Magic
- Condor 3
- Context
- Cricket Draw
- Cricket Graph
- CROSS/POINT
- Crosstalk XVI
- Crosstalk XVI for Networks
- CYMA
- DataEdge
- DataFlex
- DataLex
- dBASE Graphics
- dBASE III Plus
- dBXL
- Direct Net
- DisplayWrite 4
- Distribution Manager
- DT Network
- EasyFiler
- EasyGate
- EasyWriter II
- EGA Paint
- Enable/LAN
- Enrich
- EtherComm
- EtherConnect—LAN Interface for PC S/W
- Eureka: The Solver for the Macintosh
- Eureka: The Solver IBM Version
- Excalibur Plus
- Extended Features
- FailSafe
- File & Find
- Filemaker Plus
- Focal Point
- ForComment: Network Version
- FoxBASE+
- Framework II
- FreeHand
- Freelance
- Freelance Plus
- GEM Desktop
- GEM Draw
- GEM Graph
- GP
- Great Plains
- Harmony
- Harvard Graphics
- Harvard Total Project Manager
- Higgins Group Productivity Software
- High Stepper
- HyperCard
- ICMS
- Informix-4GL
- Informix-SQL
- InfoTrax
- Insurance Writer
- IRMALAN
- Javelin
- JetTax
- KeyEntry II/LAN
- LAN Administrator's Kit
- LAN Shell
- LAN:Datacore
- LAN:DataStore
- Lanscope
- Legal Billing II +
- LinkUp 3270 Gateways
- MacDraw
- Macola
- MacProject
- MacWrite
- Magic PC
- Manufacturing Manager
- MasterDesigner II
- MathPlan
- Maxess SNA Gateway
- Maynstream
- McMax
- MDBS III
- Me2
- Metro
- MICA
- Microsoft Assembler
- Microsoft C Compiler
- Microsoft Chart—Macintosh Version
- Microsoft Chart—PC Version
- Microsoft Excel
- Microsoft Excel for the PC
- Microsoft File
- Microsoft Linker
- Microsoft Project
- Microsoft QuickBasic
- Microsoft Word for Macintosh
- Microsoft Word for the PC
- More!
- MultiMate Advantage II LAN
- Multiplan
- NETmanager—The LAN Support Center
- NETremote—Network Productivity Tool
- NetTime
- Netway 100A/AE
- Network Co-Processor
- NIN
- NINplus
- Nursing Information Network
- O'Hanlon's Data Base Solutions
- OAT OATGATE
- Office Writer
- OMNIS 3 Plus
- Open Access II Network
- Operating Room Information Network
- Orchestrade Series
- ORIN
- OSAS
- PageMaker for the Macintosh
- PageMaker for the PC
- Paradox
- PC Focus
- PC Paint Plus
- PC Watch
- PC-Anywhere
- PC/TCP Network Software
- PCOX/Gateway—16
- Personal Editor 2 (PE2)
- Personnel Resource Network/Schedule
- PFS:Professional File
- PFS:Professional Network
- PFS:Professional Plan
- PFS:Professional Write
- PlanPerfect
- Platinum
- PLUS!76—VIP Terminal Emulation
- Point of Sale for Real World
- Poly-STAR/220 & 240 for DEC LAT networks
- Poly-STAR/220 & Poly-STAR/240
- Power Manager
- PowerBase
- PowerPoint
- PROGRESS
- Project Manager
- Property Management
- PWS/IDEAS
- Q-Pro 4
- Quattro
- QuickConnect
- QuickSilver
- R&R Relational Report Writing
- R:BASE CLOUT
- R:BASE Extended Report Writer
- R:BASE for DOS
- R:BASE Program Interface (PI)
- R:BASE Runtime
- R:BASE System V
- RDM
- Ready, Set, Go!
- Real World
- Reference Point
- Reflex—the Analyst
- Reflex Plus
- Retail Inventory Control
- Reveille
- RM/COBOL
- RM/COBOL-85
- RM/Net + S
- Sales Executive
- Samna Word Plus IV
- SBT Database Accounting Library
- Shoebox 3
- SideKick for the IBM PC
- SideKick for the Macintosh
- SmartCoin II
- SNADS Gateway/3 + Mail
- Softerm PC
- SQLBase
- SuperCalc
- SuperCalc LanPak
- SuperKey
- SuperPaint
- SuperProject Expert
- SuperProject Expert LanPak
- SURPASS
- Surveyor's Management System
- Symphony
- T3
- TCS Total Accounting System
- TEAM-UP
- TEL
- The Coordinator System
- The Sketcher
- The Smart Software System
- The Spreadsheet Auditor
- Timberline
- Time Line
- Time Line Graphics
- Total Word
- Turbo C
- Turbo Database Toolbox
- Turbo Editor Toolbox
- Turbo Graphix Toolbox
- Turbo Pascal
- Turbo Pascal Database Toolbox
- Turbo Pascal for the Macintosh
- Turbo Prolog
- Turbo Tutor
- Unify
- VALPRTSC
- Vanguard PCB Design System
- Ventura Publisher
- Vfeature Deluxe
- ViewStar Pro Series
- Volkswriter Deluxe Plus
- Volkswriter III LAN
- Volkswriter Scientific
- Windows
- Windows/386
- WordPerfect
- WordPerfect—Library
- Words & Figures
- WordStar 2000
- WordStar 2000 Plus
- WordStar Professional
- Xenix
- Xtrieve Report Writer Option
- XyWrite III
- XyWrite III Plus
- ZIM
- ZyINDEX

PROTOCOLS

- AFP
- Async
- Bisync
- DLC
- HDLC
- OSI
- SDLC
- SMB
- SNA
- TCP/IP
- X.25
- XNS

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NEW PRODUCTS

Network management

Data Switch Corp. has extended its Intellinet product line with a family of network performance measurement systems.

The **Intellinet 4200** series was designed to improve the price and performance managing of both large and small networks, and provide a menu-driven, personal computer console. The series can monitor an entire network in real time, down to the device level, according to the vendor.

Features reportedly include diagnostic data capture, automatic configuration and user-definable databases. The software offers support for asynchronous, CCITT X.25, Synchronous Data Link Control, Comten CNS trunking and other protocols.

The **Model 4205** supports from 16 to 96 lines, the **Model 4215** handles as many as 512 lines, and the **Model 4225** was designed to accommodate large, heavy data-traffic networks.

Pricing ranges from $21,000 to more than $100,000, depending on system and configuration requirements.

Data Switch, One Enterprise Drive, Shelton, Conn. 06484. 203-926-1801.

Data Switch's *Model 4205*

Digital Equipment Corp. has unveiled two network security products: the **Digital Ethernet Security Network Controller** (DESNC) and the **VAX Key Distribution Center** software package (VAX KDC).

The DESNC controller is said to be transparent to the user and incorporate encryption and decryption techniques when sending and receiving messages on the network. According to the vendor, the VAX KDC software system is necessary to manage the controller and runs on any properly configured DEC VAX processor to provide centralized management for network security.

The DESNC controller costs $6,700 per unit, and the VAX KDC software is priced at $8,400 per license.

DEC, 146 Main St., Maynard, Mass. 01754. 800-344-4825.

Links

Micro Tempus, Inc. has announced an enhanced version of **Tempus Access**, its user-to-data-link package. The software package was designed to serve as a data-extraction and job-submission facility and allow personal computer users to select, sort and extract IBM mainframe data for import to most microcomputer applications.

Version 1.1 features the Tempus-Access Windows Interface, which allows Microsoft Corp. Windows applications to import mainframe data, the vendor said. An optional IBM DB2 interface is also available.

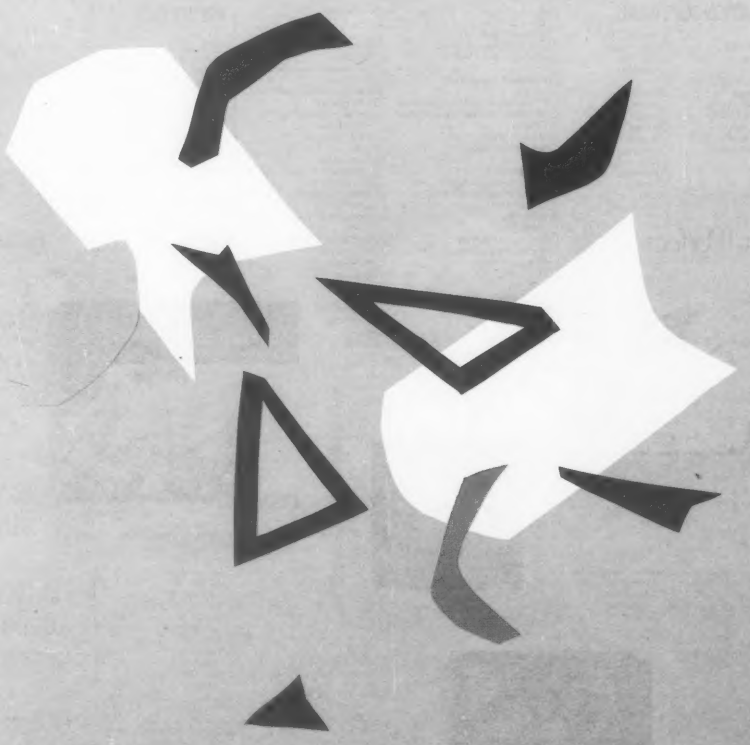
Tempus Access 1.1 costs from $11,000 to $34,000, depending on system configuration.

Micro Tempus, Suite 1700, 440 Dorchester Blvd. W., Montreal, Quebec H2Z 1V7, Canada. 514-397-9512.

The **Data Communications Division** of **Harris Corp.** has announced new color displays in its Challenger line of IBM plug-compatible 3270 communications products. The displays were designed to eliminate the need for multiplexer attachments and permit direct RJ11 twisted-pair connections, the vendor said.

Called the **H192-C** and the

How Ameritech helped Kent State



H192-F, the 14-in. monitor units support both Multidrop Coax and RJ11 cabling schemes. The H192-C reportedly has a 1,920-char. screen format, and the H192-F offers movement between four screen sizes including 132-col configurations. Both displays support seven-color presentation.

The H192-C costs $1,695, and the H192-F costs $1,895.

Harris, 16001 Dallas Pkwy., Dallas, Texas 75248. 214-386-2000.

Kinetics, Inc. will provide Apple Computer, Inc. Macintosh users with Ethernet access to Novell, Inc.'s Netware for the Macintosh, the company said. Kinetic's **Fastpath** bridges Apple's Localtalk network to Ethernet, allowing for both Macintosh computers and Netware servers to reside on either type of network.

Kinetics also manufactures the Etherport family of Ethernet cards for direct Ethernet connectivity to Macintosh II, SE and Plus systems. Both the Fastpath and Etherport products will be provided to Novell users through standard retail channels and existing Netware developers, integrators and resellers.

Kinetics, 2500 Camino Diablo, Walnut Creek, Calif. 94596. 415-947-0998.

Network Software Associates, Inc. has announced **Adaptmodem V.22bis**, an asynchronous/synchronous communications board for IBM and compatible Personal Computers, XTs, ATs and Personal System/2 Models 25 and 30.

The product reportedly provides a single-board connectivity solution by integrating the functions of three separate communications boards. Adaptmodem V.22bis supports PC-to-PC, PC-to-mini and PC-to-mainframe communications using the CCITT V.22 standard. The device consists of a synchronous modem, an asynchronous modem and a multiprotocol Synchronous Data Link Control adapter. AdaptSNA can be used with Adaptmodem V.22bis to provide PC-to-host communications via LU6.2 and IBM's Advanced Program-to-Program Communications cooperative processing.

Adaptmodem V.22bis costs $575. AdaptSNA software packages range from $295 to $795.

Network Software Associates, 22982 Mill Creek, Laguna Hills, Calif. 92653. 714-768-4013.

Telebyte Technology, Inc. has introduced a remote terminal server package for ASCII terminals attached to IBM mainframes.

Called the **Model 570 Quick Mux**, the product reportedly allows placement of as many as eight ASCII terminals at distances up to 5,000 ft away from the IBM 3174 Subsystem Control Unit. According to the vendor, each input port of the Quick Mux can accept full-duplex data at rates up to 19.2K bit/sec. Each port can also provide two control signals.

The Model 570 Quick Mux with eight cables and eight modular adapters costs $548 in single quantities. Discounts are available for OEMs.

Telebyte Technology, 270 E. Pulaski Road, Greenlawn, N.Y. 11740. 800-835-3298.

JDS Microprocessing Associates has announced a protocol converter/communications controller offering IBM Systems Network Architecture (SNA) support.

Called **Hydra SNA**, it connects directly to the mainframe and incorporates the functions of an IBM 3274 controller and an IBM 3270 protocol converter.

It was designed to allow both local and remote ASCII terminals, personal computers and printers to communicate with an IBM mainframe without the benefit of a front-end processor or controller. The product reportedly provides 3270-type emulation for ASCII PCs and terminals.

Hydra SNA models are available with 16, 24, 32, 40, 48, 56 and 64 ports. The price of a 16-port model is $12,900, and each eight-port increment on the initial purchase costs $1,000.

JDS Microprocessing Associates, Suite 206, 22661 Lambert St., El Toro, Calif. 92630. 800-554-9372.

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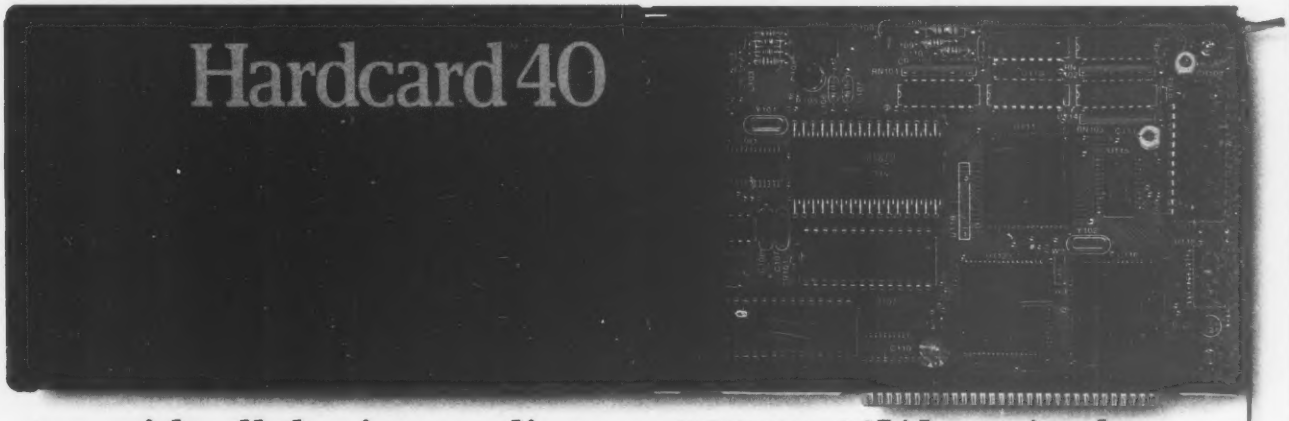

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Electronic mail

Western Union Corp. has announced **Instant Mail Manager**, communications software designed specifically for Apple Computer, Inc.'s Macintosh computer.

The product connects personal computers to Western Union's Easylink public electronic mail service. The Easylink binary transfer capability will reportedly allow Macintosh users to transmit spreadsheets, address lists, desktop publishing files and word processing documents. Through the Instant Mail Manager, users will have access to more than 900 on-line databases and a continually updated database of current events, sports and weather.

Instant Mail Manager for the Macintosh costs $195.

Western Union, One Lake St., Upper Saddle River, N.J. 07458. 201-825-5000.

Modems/ Multiplexers

Telenetics Corp. has announced a single-port CCITT X.25 mono-packet assembler/disassembler (PAD) for use over leased lines and an X.32 modem offering X.25 capabilities.

Called **Model XM1000**, the stand-alone unit is said to be compatible with AT&T 212A, CCITT V.22 or V.22bis modems for dial-up or leased-line operations.

The single-port X.25 PAD features error correction capabilities at 1,200 and 2,400 bit/sec. for asynchronous terminal users communicating with a host in a private X.25 network or through a direct connection to a public packet-switched data network.

The XM1000 costs $395. OEM discounts are available.

Telenetics, 5109 E. La Palma, Anaheim, Calif. 92807. 714-779-2766.

A modem package for Apple Computer, Inc.'s Macintosh system has been announced by **Practical Peripherals, Inc.** The package includes a Practical Peripherals **PM2400SA** stand-alone modem, two custom cables and the **Microphone** communications package from **Software Ventures.**

The PM2400SA is a 2,400, 1,200 and 300 bit/sec., Hayes Microcomputer Products, Inc.-compatible modem that normally retails for $239. With the Microphone communications software and cabling set, the bundled product costs $299. A five-year factory replacement and repair warranty is included with the purchase.

Practical Peripherals, 31245 La Baya Drive, Westlake Village, Calif. 91362. 818-706-0333.

An eight-port, asynchronous multiplexer is now available from **Excelan, Inc.** The **Export 2000 Communications Server** reportedly connects RS-232 devices to Ethernet via Transmission Control Protocol/Internet Protocol.

According to the vendor, the product can receive its operating software from a variety of host computers; the software can come from DOS-, Digital Equipment Corp. VMS-, MicroVMS- and Sun Microsystems, Inc. SunOS-based systems. Interacting with the host units, the product can perform various network management tasks, including booting and configuring other servers, the vendor said.

The Export 2000 costs $2,495. Volume discounts are available.

Excelan, 2180 Fortune Drive, San Jose, Calif. 95131. 408-434-2300.

A full-duplex, 9.6K bit/sec. modem is now available from **Fastcomm Communications Corp.**

Based on CCITT V.32, the **FDX 9624** reportedly allows data to travel at 9.6K bit/sec. in one direction and 1,200 bit/sec. in the other direction without using echo cancellation. The unit operates over the Public Switched Telephone Network or over leased lines, the vendor said. It also uses Microcom Networking protocol Class 5 adaptive data compression.

The FDX 9624 costs $899.

Fastcomm Communications, 12347-E Sunrise Valley Drive, Reston, Va. 22091. 800-521-2496.

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Users find less pain, more gain with outside specialists

LARRY STEVENS

Jerry Garbacz learned one thing working for the Pentagon that stood him in good stead when he took a job in the book publishing trade: Managing information systems does not necessarily mean that you do everything yourself.

Garbacz had his hands full when he first arrived at Baker and Taylor Books, Inc., a New York-based distributor with more than 100,000 general-interest titles. At that time, the firm provided a networked book acquisition system as a value-added service for its U.S. public library clients. It was a nice touch, Garbacz says, but there was a problem: The service didn't work.

"The old system had so many problems that end users mostly ignored it," explains Garbacz, now executive vice-president at W.R. Grace & Co., which is Baker and Taylor Books' parent company. "The database was difficult to access, the response time was lousy, and there was a lack of integration between the inventory database and the warehouse, so information currency was poor."

The former U.S. Department of Defense employee changed all that when he hired American Management Systems, Inc. (AMS), an Arlington, Va., systems integrator, to handle the Baker and Taylor Books book acquisition project from planning to implementation.

The AMS system now in place at Baker and Taylor Books allocates and monitors all library funds, tracks library branch spending and provides statistical data on branch book purchases. The systems integrator also provides nightly store-and-forward services, providing a telecommunications buffer between the customer and the Baker and Taylor Books computer.

Stevens is a free-lance writer based in Springfield, Mass.

MIKE McLAUGHLIN

INSIDE

MIS departments seek profits in integration business
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Can hardware vendors be objective integrators?
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Look before you leap: A precontract checklist
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When Garbacz made the decision to hire AMS seven years ago, most business organizations had not even heard of systems integrators — let alone entertained the possibility of using one.

Garbacz only thought about looking outside for help because he was emerging from an environment — the federal government — in which employment of systems integrators has long been commonplace.

Systems integrators are companies that perform the tricky task of tying diverse populations of hardware and software together into a unified package, as fixed-price contractors.

What they do

The types of jobs that systems integrators tackle may include the following: the creation or combination of software for data processing, the building of turnkey DP systems, data communications projects such as electronic data interchange (EDI) and the custom creation of combined voice and data networks.

According to Ernest Keet and John Pendray — whose recent book, *Strategic Development for High-Technology Businesses,* looks at systems integration as "an emerging trend in the information industry" — the union of DP and data networking for applications like EDI and manufacturing resource planning is now the highest growth area of systems integration. This is opposed to the construction of cohesive DP systems, which is the oldest market for integrators, and the unification of voice and data, which is still emerging.

Similarly, a commercial market for systems integration is

More gain

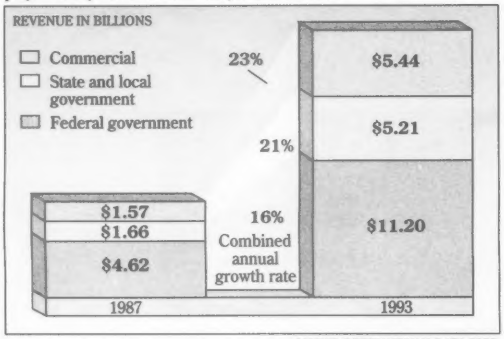
FROM PRECEDING PAGE

just beginning to develop. The federal government has long been and still is the major consumer of systems integration services.

Researchers estimate that about 30% of all federal computer buying is through systems integrators.

Business boom

The commercial section will produce the highest combined annual growth rate in the systems integration market, based on projections of worldwide revenue for U.S. vendors



SOURCE: INTERNATIONAL DATA CORP.
CW CHART

In 1987, the federal government spent $4.62 billion through and on systems integrators, according to International Data Corp. (IDC), located in Framingham, Mass. The market research firm predicts the government will spend $11.2 billion in 1993.

Already, however, there are strong indications in the air of substantial growth potential in the commercial sector. According to IDC, commercial customers spent a total of $1.6 billion on and through systems integrators for hardware, software, subcontracting fees and direct fees in 1987 and will spend $5.4 billion in 1993.

Other research firms are projecting similar growth curves. The International Technology Group, headquartered in Los Altos, Calif., for example, estimates that revenue from commercial systems integration will climb to $4.5 billion by 1992, at which point the sector will account for roughly one-third of the total systems integration market.

Current trends

The current interest in systems integration among commercial organizations is largely a result of four trends that have been building for some time. These are the following:

- The increased use of open systems architectures such as Unix, which make connecting products together easier.
- The increased acceptance of canned solutions such as packaged software.
- The myriad varieties of hardware and software used in decentralized organizations.
- The breakup of the monopoly control over customer sites by major vendors of proprietary systems. For example, in its shop a user might have an IBM mainframe alongside non-IBM auxiliary and peripheral equipment.

But the expectations and attitudes that commercial organizations are bringing to that search seem to differ significantly from those exhibited in the government sector.

"The commercial market is more interesting and fluid because of the lack of contracting procedures," says Jack Epstein, vice-president of the integration group at IDC. "The tradition of turning to resources outside of the company is not there, and so the rules for doing so are not set."

Procedurally, he says, that means commercial users are more likely than federal buyers to use a mix of resources to complete their projects, including systems integrators, consultants, subcontractors and in-house MIS staff.

Vague uneasiness

In part, this tendency to treat systems integrators as part of a larger mix may reflect the pronounced uneasiness that many MIS managers in commercial organizations now seem to feel regarding this type of service provider.

In many cases, the decision to hire a systems integrator originates with upper management, and it is MIS that acts as the resisting element.

Among the reasons that company executives are inclined to consider the use of systems integrators is the fact that they offer a means of getting a project completed quickly, without either overburdening internal resources or adding temporary personnel to the payroll.

According to Epstein, top executives often like using a systems integrator because it minimizes conflict between the dual priorities of completing a special project and support for day-to-day business operations.

"Upper management hears about the MIS backlog every time they ask for a new project and are told they have to wait three years," Epstein says. "They don't want to add to that backlog."

Predictability of costs is another major advantage from the viewpoint of corporate management.

The contractual statement of a fixed price for a project transfers the risk of price overruns from the corporation to the integrator, which — at least theoretically — has the skills in bidding and project management to complete a project within budget.

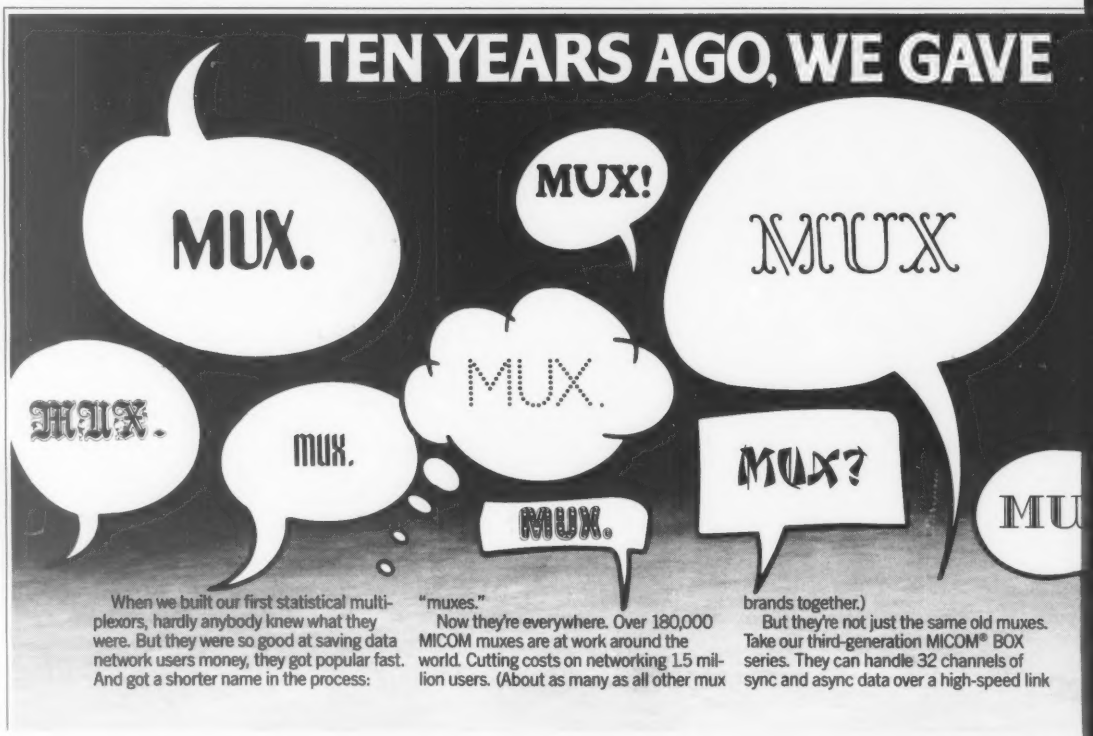
While experts estimate that the price quoted by systems integrators tends to be 5% to 10% higher than an organization would pay for time, materials and consulting services, many view that markup as worthwhile

Continued on page 96

The bad news

Commercial systems integration is being hailed as a major new growth phenomenon in the information systems marketplace. Norman Weizer, senior consultant at Arthur D. Little, Inc. in Cambridge, Mass., tempers the optimistic rhetoric with the following six reasons why systems integration may not achieve the kind of sweep that is often projected:

- **Sticker shock.** Using systems integrators is going to be much more expensive for users than handling integration in-house. Costs could be double or triple the base hardware cost on average.
- **Limited appeal.** A lot of smaller users — from small mainframe users down to personal computer users — are not going to need it. The channels that already exist for people to put together an entire package will be more than adequate for a lot of customers.
- **Learning curve.** It will take some vendors a long time to understand how to do business this way. There are a lot of barriers: How do you compensate your sales force? How do you get them to work as part of the team rather than against it? How do you convince a user that you have the capabilities to do systems integration?
- **Slow takeoff.** It could take a long time for hardware and software vendors to figure out that systems integration is the business they should be in and then do something about it.
- **Bad press.** Because this is a new way of doing business, a lot of failures will occur in the beginning, and that is going to scare potential customers.
- **Fear of the unknown.** A lot of users don't want to give up that much control. They don't feel safe giving outsiders control of projects that they don't fully understand.



MIS stakes a claim in new service field

BY DAVID GABEL

Some corporate MIS departments are smelling gold in the systems integration business, and they are looking to stake their claim while the prospecting is good.

While it is difficult to gauge the full magnitude of corporate MIS' movement toward the systems integration business, managers in systems integration, and some analysts, say the market for this kind of service is growing, with no end in sight.

Definitive numbers are hard to come by. Nevertheless, the business must be expanding, as more large corporations, such as Deere & Co. and Weyerhaeuser Co., are spinning off separate subsidiaries to handle systems integration and other kinds of computer-specific chores for a profit.

Whether one is engaged in systems integration or not can be a matter of definition. The function could be defined as merely recommending particular hardware to run a vendor's software, or software to run on some specific hardware.

Generally speaking, however, the systems integration function involves more: It implies the capability of providing a complete solution to a customer's problem. The problem could be distributed data processing, networking, computer-integrated manufacturing (CIM) or a more vertical function.

Gabel is a free-lance writer and a former data center manager based in Northport, N.Y.

More than delivery

"Systems integration is a catch-all term meaning the delivery of hardware, software and services for the solution to some user requirement," explains Ernest Keet, coauthor of a book that examines the systems integration function and market possibilities in detail.

But systems integration is more than just delivery. The term also implies the provision of a complete computer-based solution to some customer problem — the hardware to run the task, the requisite software and the service and support to keep the solution going. This is the function in which Keet sees MIS professionals becoming more involved.

MIS departments usually start in systems integration by providing integration services for the rest of the corporation — hiring a data communications expert, for example, or a database maven.

"Or suppose that the company needs to develop a new personnel system," Keet says. "They may take a manager from a line position and turn him into the project manager for the coordination of the development effort.

"In these cases, the customer is the corporation itself," he explains. "In some cases, the integration is performed by an affiliate or a partially owned subsidiary."

This function has almost been forced on the corporation because of the need for control and standardization in the office. But the systems integration expertise that MIS professionals and others develop in the process of working for their customer, the corporation, gives them the know-how to go out and sell the organization's own systems integration services to others.

> "FIRST OF ALL, we felt the market was there. We also looked at our skills and thought we could compete successfully in that market and . . . that if we were in the market competitively, it would improve our own skills at the same time.
>
> JOHN CHURCH
> WEYERHAEUSER INFORMATION SYSTEMS

Competition, expertise

"We thought there were several reasons for getting into the business," says John Church, director of the information services division of Weyerhaeuser Information Systems in Federal Way, Wash.

"First of all, we felt that the market was there. We also looked at our skills and thought we could compete successfully in that market. And there was a third motive: We thought that if we were in the market competitively, it would improve our own skills at the same time."

Weyerhaeuser's Church

Church's organization, which started off as an internal corporate MIS organization, provides systems integration services to clients both inside and outside the parent corporation.

"Right now," he says, "we are developing a court information system for the state of Washington. While we don't sell the hardware specifically, we help the customer make the hardware decision, and we provide software, support, installation and communications."

Church says that his organization is still providing much of the data processing for other Weyerhaeuser divisions on a competitive basis.

"Some of the divisions do their own [processing] or contract out. We have no captive market within the corporation," he explains. "Our internal business is something that we have to earn."

How one determines if there is a market to be exploited is a major question, and often people don't explain how they did it. Reading market studies is one way to examine new markets. But the MIS manager who can claim an experience similar to that of David Scott could be thought of as truly fortunate.

Scott, marketing manager at Deere Tech Services in Moline, Ill., and his group were involved in systems integration for John Deere's manufacturing operations.

The group participated in a number of different projects involving automated systems and robotics, for which they made purchase recommendations, installed systems and provided training.

After the tech services group's work won a company prize, "the phone started ringing," Scott says. "We decided that we should explore the market opportunities and convinced the corporate fathers that they should let us spin off a separate organization."

So Deere Tech Services was set up as a consulting and systems integration operation consisting of "people like LAN consultants, systems integration consultants and others — guys who can wire the controllers to the robots on the shop floor," Scott explains.

Things must be going well, because Deere Tech was a major player at the Enterprise Networking Event, a showplace for network applications recently held in Baltimore. Scott's group systems integration contract from the U.S. Air Force for its booth required setting up some examples of CIM in that booth and networking other exhibitors' booths together.

Making the move

Should DP managers plan a move for their organizations into systems integration? There are several considerations.

First of all, it seems that there is, indeed, gold in the systems integration hills. "Demand for systems integration is going nowhere but up," author Keet says. People have already done the back-office stuff, and now they are turning to things that will change the competitive nature of their business.

"Business is so good," Scott points out, "that we are having trouble allocating resources to meet the demand."

Church adds that "there are new places for applications that didn't exist before. As the price of the hardware and technology

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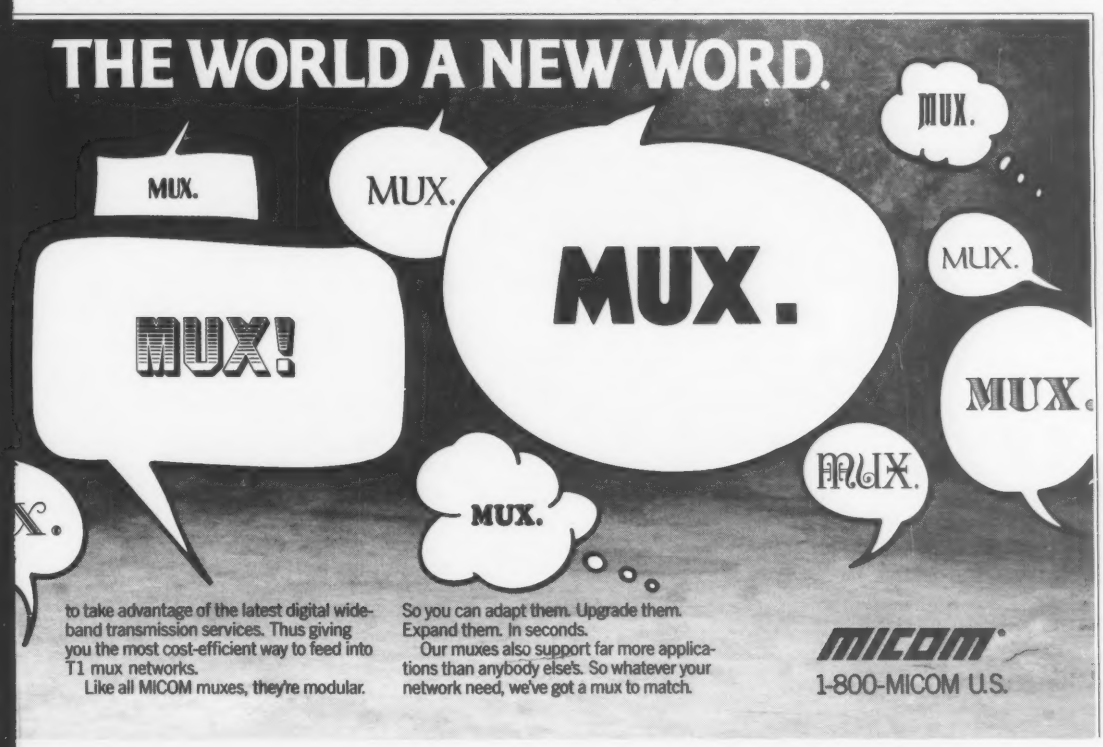

More gain

FROM PAGE 94

insurance against the possible danger of a project skyrocketing in cost.

"The biggest advantage of dealing with a systems integrator is that you eliminate most surprises," Garbacz says. "You know how much things will cost, how long it will take to implement them and how it will work."

Taboo topic

So far, however, it seems that many MIS managers are not convinced by that argument. While few feel free to speak on the record, there is clearly a feeling in some organizations that integration of systems is a job that belongs in-house.

Several MIS managers contacted for this article refused to go on record for "internal political reasons."

In one case, an individual explained that he did not "want to take sides on the issue of his company's MIS vs. the systems integrator."

In the course of speaking with organizations for his own research, IDC's Epstein says he has also found some opposition to the employment of systems integrators. "Some MIS people are concerned with being replaced, since they were formerly the integrators," he says.

The opponents are not the majority, Epstein adds. There are many MIS managers who don't feel there is any discredit attached to the use of trained outsiders for special projects that would put additional strain on staff resources.

Melanie Kurdys, manager of business information systems at Owens-Corning Fiberglass Corp. in Toledo, Ohio, is one of those managers.

When Owens-Corning decided it needed a systems integrator to connect 12 Hewlett-Packard Co. 3000 Series 70 minicomputers at its six plants and six customer service centers to the IBM mainframe in the headquarters in Toledo, Kurdys coordinated the project.

"We wanted one supplier who could do everything for us," she says. "It was not just hardware. It was the installation, the loading of the software, the testing, the wiring and the training. And it had to be done at six remote locations."

For Kendall McGaw Laboratories, Inc. in Irvine, Calif., the decision to use a systems integrator came down to a matter of time. "We have a lot of in-house expertise, and we probably could have done the work ourselves," says Lee Rizio, Kendall McGaw's director of management science information services. "But we had a deadline."

Two years ago, the company, a supplier of hospital laboratory equipment, was sold to the Kendall Co. after the buyout of its parent company, American Hospital Supply Corp. This meant that Kendall McGaw had to create its own direct order system to replace the one that American Hospital Supply had provided.

The system that had to be replaced connected client hospitals to the company's computer. It accepted hospital orders, routed them to the nearest warehouse and sent back information about when the order would arrive.

Recreating that kind of system was especially difficult, Rizio explains, because of the large variety of input devices used by client hospitals.

"We might prefer that all the hospitals use, for example, an IBM PC," he says. "But we can't dictate that. Some have a Teletype, some a terminal and some a mini. We work pretty much at the request of our customers. It's hard to have in-house skills that cover connecting so many different devices."

> "SOME MIS people are concerned with being replaced, since they were formerly the integrators."
>
> JACK EPSTEIN
> IDC

Actually, McGaw (or Kendall McGaw, as it became after the sale) did not find a systems integrator able or willing to take on the whole chore. Instead, it arrived at a compromise and assigned a portion of the complex project to McDonnell Douglas Information Systems Co.

Lists, lists, lists

The way that came about is this: After meeting with users, Rizio drew up three lists. The first contained those components that were absolutely necessary for the new system to run successfully. The second contained those things that were important but that the company could do without if it had to.

The third list contained those things that the company would like to have but that were not important. Each item on the three lists was given a point value.

The list was then sent to 10 integration companies, each of which submitted proposals that included as many of the items on the lists as it could supply, along with the price.

McDonnell Douglas Information Systems, a division of McDonnell Douglas Aircraft Co., came in with the highest point value, but it had excluded some of the items on the must-have list. Those items were then negotiated.

McDonnell Douglas Information Systems decided to do about one-third. Kendall McGaw determined that it could delay one-third for at least the first phase of the project and that the company would take on about one-third itself.

Sometimes, as in the case of Alcoa Laboratories, Inc., the choice to share out a project between staff and a systems integrator is more deliberate.

Alcoa did this in 1984, when it needed to install a broadband local-area network. The project

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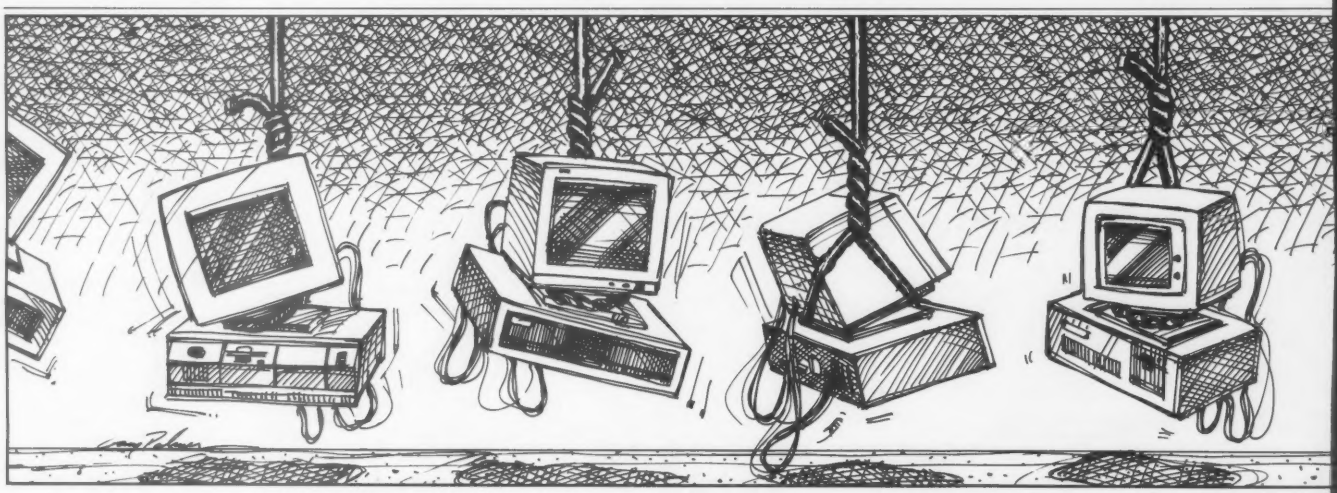

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Can manufacturers be objective?

Although favoritism does occur, integration customers need not suffer

BY LARRY STEVENS

The traditional definition of a "systems integrator" is an independent coordinator who stitches together elements of hardware and software from a variety of vendors to create seamless computing environments. To some degree, however, that definition has been complicated by the entry of hardware vendors into the systems integration business.

A number of manufacturers, including IBM, Digital Equipment Corp., Unisys Corp. and Xerox Corp., have started up systems integration divisions. This trend has given rise to some important questions about objectivity.

How objective can an integrator be that is tied to a hardware producer? Opinions may vary, but some industry observers say that — while some bias does exist — it does not necessarily affect the quality of the end result.

The profit motive is not the only reason that vendor-owned systems integrators would tend to recommend their parents' products, says Irv Shapiro, president of ISA Consultants Ltd., a systems integration consulting firm.

"It's natural that they would know their own products best and feel most comfortable with them. And they'll probably do the best job on them," he points out. Besides, Shapiro adds, although there may be some pressure to use the parent company's products when possible, market considerations make incorporating a competitor's hardware attractive to a vendor.

ADL's Weizer

Foot in the door

For example, Shapiro says, IBM and DEC are both eyeing each other's markets, and integration is a way to get a foot in the door.

"IBM's market is immense and very loyal," Shapiro observes. "It's unlikely that Digital will break in unless it ties its products into IBM's. And IBM is learning that it has to say, 'OK, use Digital for the things we can't do, and we'll help tie it to our hardware for you.' "

Norman Weizer, senior consultant at Arthur D. Little, Inc., agrees that most major hardware vendors are moving from a position of insisting that their products can do everything to one that takes into account the multivendor configurations of many installations.

"It is clear from recent meetings with IBM that they consider integration the wave of the future," Weizer says.

While IBM integrators will tend to write software to IBM machines, in a competitive proposal situation, they will be compelled to consider other machines if the situation warrants it.

Weizer also points out that users and even the parent company expect the integration divisions of hardware vendors to at the very least consider alternative hardware solutions.

This expectation stems from the fact that the integrator is generally called in only on complex problems that require going outside the company's hardware.

He says, "By the time the systems people are brought in, the sales people already had a shot at it and couldn't come up with a solution."

Even if integration divisions do tend to use their parent company's products whenever possible, that may not be a problem for many clients.

> "IF A COMPANY is 80% IBM, it is not going to be upset if most of the hardware solutions offered by an integrator are IBM."
>
> KAREN KUGEL
> IDC

Shared bias

Companies that call on the systems integration units of hardware vendors probably expect and share a bias toward those companies' systems, says Karen Kugel, program manager of computer services at International Data Corp., a market research firm in Framingham, Mass.

"If a company is 80% IBM, it is not going to be upset if most of the hardware solutions offered by an integrator are IBM," she says.

Kugel says that in her interviews with users, fear of bias ranks third or fourth on the list of selection considerations. The No. 1 concern is that the integrator have a superior knowledge of the hardware and application.

The second concern lies in the ability to integrate the equipment that an organization already has in place — the constant of the problem — with the rest of the integrator's recommended solution.

Close ties

Bob Johnson, vice-president of sales and marketing at Unisys, admits to a bias toward Unisys products. But he adds that Unisys integrators have an advantage in that they are closely tied to the company's design and engineering divisions.

"We are closer to information about future products. And this goes the other way as well, since we can make suggestions for

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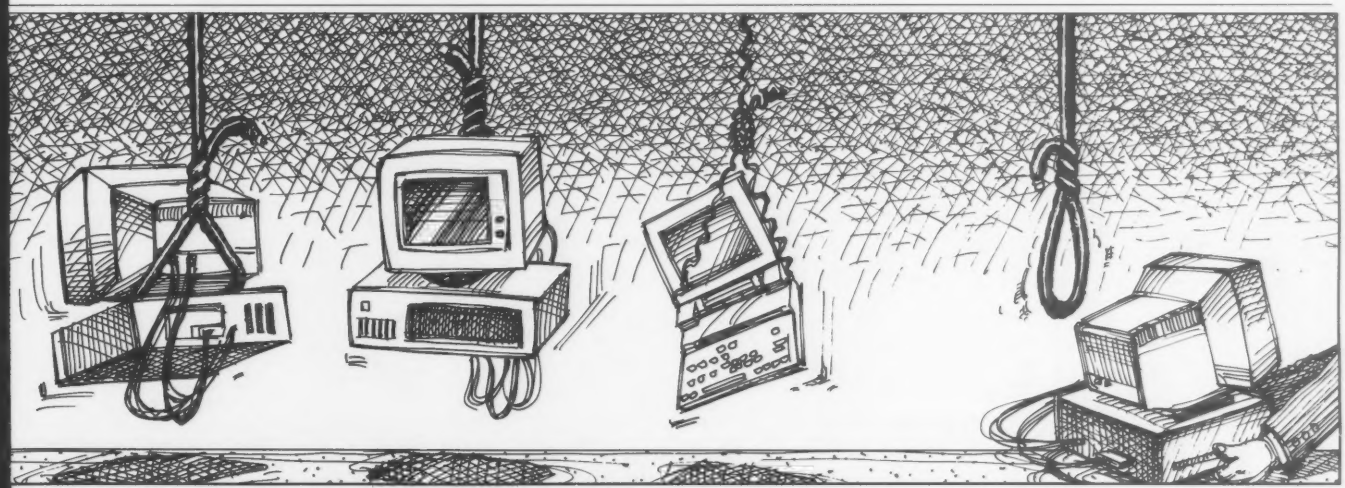

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Caution: Read the fine print

When negotiating a contract in a relatively new area such as systems integration, where precedent cannot be your guide, it is important to scrutinize both wording and assumptions.

Julian Millstein, a partner in the New York law firm Brown, Raysman and Millstein, recommends that organizations take the following measures before signing a contract with a systems integrator.

Millstein, who concentrates in litigation, contract negotiation and other areas of law as they relate to computers, is also the editor-in-chief of *The Computer Law Strategist.*

- Research the company you're dealing with. Does the systems integrator have the manpower to do the job? Are its relationships with its suppliers sufficiently established so that it can guarantee delivery of components in a timely manner?
- Stipulate the exact parameters of the job. You should know from the start whether the systems integrator will be responsible for training, documentation and all the various interface requirements. If the various hardware and software can't interface, you've just bought a bunch of things that don't work together.

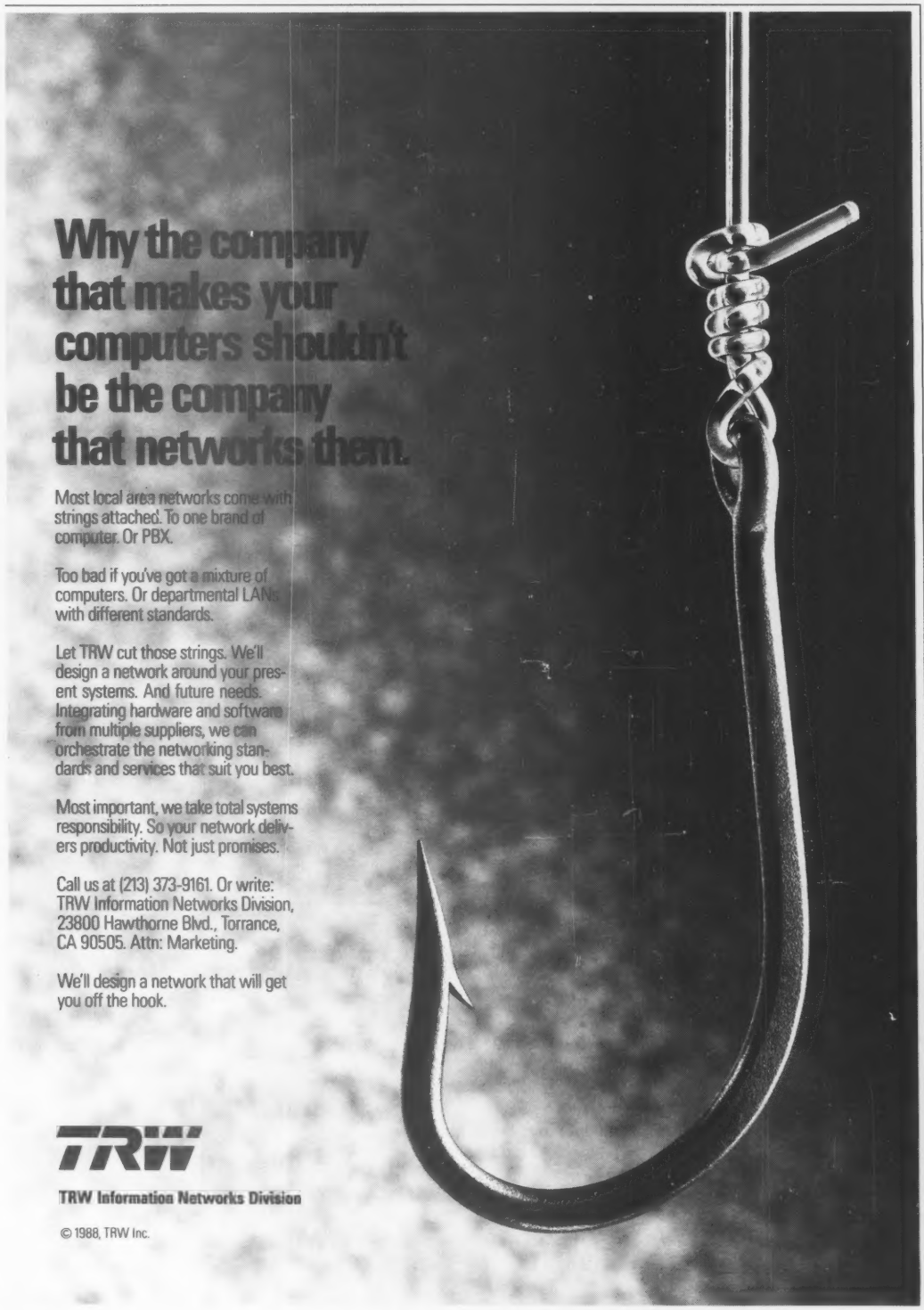
You should also address the coordination of maintaining the various systems. If the systems integrator will not agree to handle maintenance, you may be left dealing with five different entities.

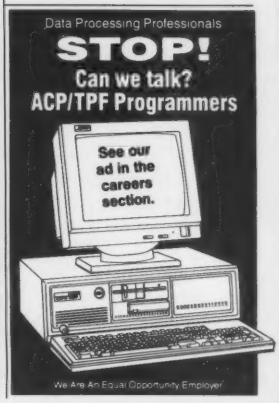
- Insist on specific assumption of responsibility for the ongoing compatibility of the various components. Often, as the hardware is being modified by its manufacturer, the application software and the operating system software also undergo new releases. Is the systems integrator going to stand behind and somehow ensure the various components' compatibility over time?
- Determine what warranties the systems integrator is willing to offer on the overall package. Is it willing to stand behind not only its own work but also that of suppliers of the various components?
- Don't shortchange yourself when drawing up the payment schedule. Make sure that you hold back a sufficient amount of money until you can determine that the various components work together the way you would like.
- Make acceptance of the parts contingent upon the performance of the whole. Specify your criteria for acceptance of the overall system and reserve the right to test or benchmark the system as a whole before committing to purchase any specific component.

For example, if hardware is coming from one source and software from another, you don't want to be in the position in which you're committed to purchasing the hardware without getting a guarantee that the software will function on that hardware.

Frequently, contracts aren't set out that way, and organizations discover too late that they have committed to buying a half-million dollars' worth of hardware without having had a chance to properly benchmark and stress-test the application.

- Ask for definitions of terms. Don't take anything for granted, because usage in the computer industry changes rapidly. •





More gain

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involved designing and installing the physical system as well as some software design.

"We had many of the skills needed to install the system in-house," says Alex Lezark, technical specialist at the company. "We knew something about broadband design, we knew about wiring, but we just weren't confident enough to tie it all together, and we couldn't find anyone with that experience to hire."

So the engineering and MIS departments at Alcoa got together and decided to hire TRW, Inc.'s Information Networks Division to help design the system, provide the interface devices and some software and help supervise the wiring.

The project was controlled by one of the engineers at Alcoa; the relationship between TRW staff and Alcoa engineers was similar to that of skilled subordinates to supervisors. The engineer monitored the progress and guided the installation, including making the decision about when to hire contractors.

Near the end of the process, Alcoa finally found and was able to hire a LAN expert, who took over supervision of the project and made some course changes. "We had hired TRW in place of hiring a LAN expert, which we couldn't find at the time," Lezark says. "Basically, TRW was replacing one employee."

Evaluate, then choose

Even if the responsibilities of systems integrators are more limited in the commercial sector than they traditionally have been in the government, the systems they are working on are so critical that deliberation is advisable in the selection process.

Since systems integration is a service, choosing a vendor often means evaluating proposals rather than viewing demonstrations. The initial phase for most companies is to determine the exact requirements of the project, including the time frame, geographic considerations and resource requirements.

Although there is a lot of crossover between vendors that specialize in federal projects and those that specialize in commercial accounts, some significant differences exist.

Systems integrators that specialize in federal projects tend to be generic — large companies that can supply many kinds of computing services. Martin Marietta Corp. and Electronic Data Systems Corp. are two prime examples. On the other hand, integrators that specialize in commercial projects may be smaller and often have limited vertical niches. There is also often a willingness on the part of the commercial systems integrator to take on smaller parts of projects.

SINCE SYSTEMS integration is a service, choosing a vendor often means evaluating proposals rather than viewing demonstrations.

At Owens-Corning, the first step was to convene a "joint applications development group." This search committee consisted of 40 people from all over the company, including customer service, production, marketing and MIS.

The group hammered out the requirements of the new system. The main point was that customer service representatives must be able to immediately access accurate information about parts, including where a part is, when it can be shipped and when it will arrive at the customer site.

Then came the process of proposals, evaluations and new proposals, in which vendors had an opportunity to respond with better timing or pricing. Owens-Corning eventually chose Centel Business Information Systems primarily because it was the only company that could perform all the component tasks involved in the project, including training.

Kurdys says, "Most of the vendors submitted proposals that didn't meet all our needs. Normally, the missing component was training — and the suppliers weren't even willing to subcontract that out."

Another issue to consider in choosing a vendor is to find one that is willing to go beyond its contractual obligations to do what is necessary to get the job done. Kurdys remembers a situation in which lightning hit a controller in a customer service center just as the network was

Continued on next page

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More gain

FROM PRECEDING PAGE

being installed. The Centel service representative couldn't finish his work until the problem was cleared up, so he helped Kurdys determine what parts had to be replaced.

Although loss of managerial control is a concern for some MIS managers in contemplating the use of integrators, Garbacz maintains that managing one is in some ways easier than managing in-house personnel, since there is no need to oversee the project on a daily basis.

His main responsibility, Garbacz says, was to make sure the integrator met the requirements that had been laid down in the contract and that work was proceeding on schedule.

One management challenge, Garbacz notes, is to decide which tasks to take over in-house and when is the best time to do that. This decision is a judgment call: There are no set rules for when projects can be transferred to in-house personnel.

At Baker and Taylor Books, many of the maintenance responsibilities for the system were taken over by the in-house staff relatively quickly, as the company developed skills in telecommunications and database management.

Later, as needs arose for ancillary products, they were created in-house. These were short-term projects and did not require an inordinate expenditure of resources, and the necessary skills to perform them were developed gradually.

Garbacz points out that some tasks are best never brought in-house. For example, one of AMS' responsibilities is to accept and store transmissions from Baker and Taylor Books' customers and then forward them on batch each night to W. R. Grace. This eliminates the peaks and valleys of work that come when transmissions can be received at any time during the day or night, and Garbacz can better allocate his resources.

> "IN TERMS of expertise, we're way ahead of seven years ago. But in terms of available resources, we're about in the same place."
>
> JERRY GARBACZ
> BAKER AND TAYLOR BOOKS

Baker and Taylor Books has no plans to take on these telecommunications tasks. Garbacz says, "In terms of expertise, we're way ahead of seven years ago when we started the project. But in terms of available resources, we're about in the same place. Our backlog of potential projects always exceeds our manpower. That's an ideal management situation, but it's not one that encourages taking on large-scale endeavors."

What happened at Alcoa — at first, a close relationship between in-house staff and the systems integrator and eventually the total transfer of responsibility to in-house personnel — is, however, probably more typical of commercial use of systems integrators.

Systems integration in the commercial sector will not replace in-house staff or become a primary way of performing projects. But as more companies find themselves looking at large-scale projects involving different kinds of hardware and requiring skills that will be needed for only one job, using integrators will be an attractive alternative. •

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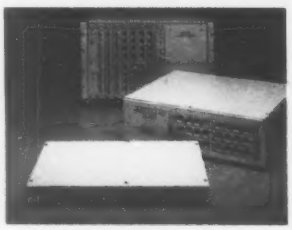

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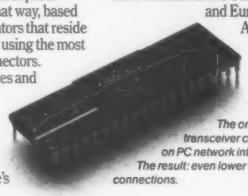

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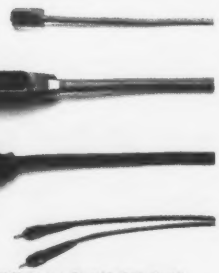

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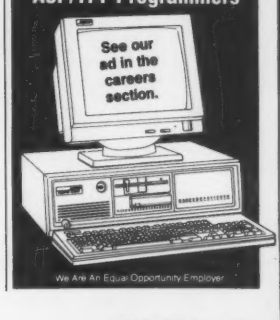

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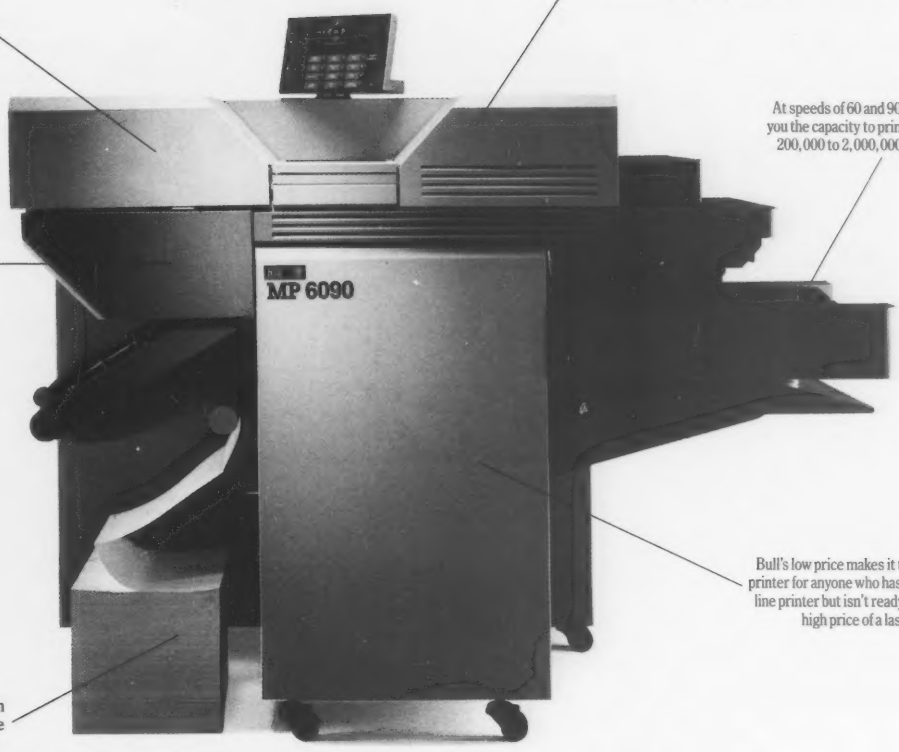

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MIS stakes

CONTINUED FROM PAGE 95

drop, more applications become doable."

Also, as in other areas of the computer industry, there is a trend toward spinning off successful internal projects into the commercial marketplace.

Some of these projects can produce big bucks, too. According to Church, his company is involved in projects at about the $1 million to $5 million level, but some contracts can go to hundreds of millions of dollars.

But what does it take for a DP or MIS organization to become a systems integrator as well? Church offers some basic ideas.

First, he says, the parent organization must persuade itself — or be persuaded — that such a move is one worth backing. There must also be a commitment within the organization and its parent to stay the course. "This takes a lot of work," Church says. "It's not for the faintheartened."

Second, the organization may need to incorporate different skills from the ones it currently has available — a communications expert, database guru or personnel specialist, for instance.

It may be that in a few more years, aggressive MIS managers will have changed the systems integration landscape. According to Keet and Pendray, "These may be the real sleepers in commercial systems integration: MIS shops run by profit-driven managers who thirst for extra-company challenges." ●

Objective

CONTINUED FROM PAGE 97

product changes," Johnson says.

According to Johnson, since there are always several different methods of solving a particular problem, the issue is not which vendor's products are used but rather how well the solution chosen works in the end.

Experts agree with this "proof-is-in-the-pudding" analysis. Most say that when considering integrators, hardware vendors should not be rejected out-of-hand. Conversely, they should also not be hired simply on the basis of their hardware connection.

Don't be blind

"You can't ignore hardware vendors. But you also can't be stupid about it," Weizer says. "I wouldn't trust a manufacturer blindly, just as I wouldn't trust an independent integrator blindly. You get proposals from a number of integrators and you weigh the pros and cons."

Another safeguard, suggested by ICA Consultants' Shapiro, is to use an independent systems integrator as an auditor. If there is any concern about bias, he recommends that an organization hire a second, unallied integrator to oversee the project.

"All companies have two accounting firms: one to do the books and one to check them," Shapiro points out, and there is no reason why the same method cannot be used with systems integrators. ●

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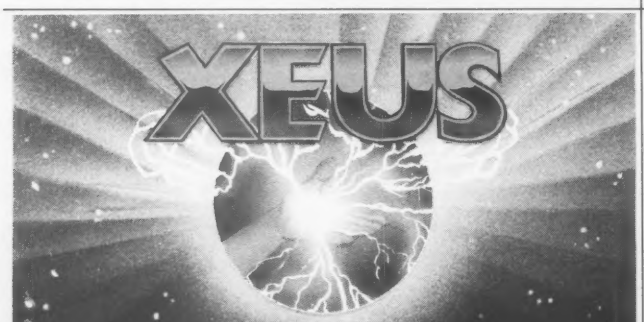

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The quantum computer

It's so fast, it finishes executing an instruction as soon as it starts

BY LEE GRUENFELD

KEN CONDON

Quantum physics is one of the most bizarre and profound theories of the physical world ever proposed. But can any of its mysteries be put to use to build a revolutionary computer that executes instructions in zero-time? If the theory of the quantum can be successfully translated into computing circuitry, we may well see the last generation in information processing technology.

Quantum theory, like Einstein's theory of relativity, is taking a while to catch on with the general populace. Relativity theory was around for only 14 years before the first hard experimental confirmation was obtained in 1919, and it was many more years before some of its counterintuitive implications became the stuff of high-school physics classes.

Quantum theory, however, has been in existence for about 70 years and still has not reached the level of acceptance or understanding achieved by relativity. It suffers many of the same plagues that relativity did, but in more virulent form. Its mathematical bases are vastly more complex than those of relativity, and quantum theorists argue constantly about whether their equations even represent reality or are just convenient models.

Indeed, the physical implications of the theory are so patently ridiculous that no sane person can avoid an instant rejection of them at first hearing. Where Einstein tampered with the fabric of the universe, quantum theorists attack our very notions of reality itself and leave them in tatters. In fact, to his dying day, Albert Einstein himself refused to believe some of the theory's implications, even though he laid a good deal of the foundation for its postulation.

In spite of the barriers to acceptance, quantum theory has proven to be the most stunningly successful description of physical reality since Einstein demonstrated Newton's theories to be simply a special case of general relativity, at least when Newton wasn't wrong altogether.

In fact, a subset of quantum theory, known as quantum electrodynamics, is now regarded as the most accurate description of subatomic interactions in all of physics: No significant discrepancies have ever been found between the predictions of quantum electrodynamics and the most precise actual measurements it is possible to make.

And while quantum physics has not achieved the household status of relativity because of the difficulty of grasping its concepts and the assault on our common sense, it nevertheless stands as a pillar of intellectual achievement that has withstood every test and challenge.

It is so strong that, in those cases where it is in disagreement with relativity, it is beginning to appear certain that quantum theory will prevail.

Still, for quantum theory to become as famous among the general populace as relativity, a "demonstration" would be helpful. A computer that takes no time to execute might do the trick. How might the principles of this strange theory help build one?

Bottom-line units

Today, the quantum transistor in the early stages of development (see story page 108) takes advantage of several predictions of the theory such as resonance, which is what the electron waves are doing in the "quantum well" as they bounce back and forth and constructively interfere with one another. However, it does not exploit an even more interesting implication of the

Gruenfeld, a management consulting partner in the Los Angeles office of Touche Ross & Co., specializes in strategic information systems planning. The ideas in this article are the result of his personal study of theoretical physics.

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theory, namely, that quantum-state transitions occur *instantaneously.*

What is it about quantum theory that would lead us to believe that things can happen with no passage of time? The theory is based on the assumption that, at the most fundamental level of physical existence, things are not infinitely small but in fact have a discrete bottom line.

For example, the amount of electric charge carried by an electron is the smallest amount that can exist — ignoring quarks, which likely cannot be isolated anyway and would only complicate a discussion of quantum computing. Any electric charge at a more macro level is made up of whole-number multiples of this unit electron charge.

Similarly, electrons around a nucleus can only occupy discrete "shells," or energy levels. While they can jump from level to level as energy is absorbed or radiated, there can be no existence between the shells.

THE PROBLEM at the quantum level, however, is that the thing being measured is, by definition, quantized and already represents the lowest possible energy. Therefore, any energy imparted must necessarily change the state and ruin the measurement.

Keep in mind that quantum theory is based on the ultimate indivisibility (quantization) of everything that exists. Electrons jumping across energy levels around an atomic nucleus take on no intermediate values during the jump. Knowing this fact leads directly to an interesting question: What happens to the electron after it leaves the first level but before it gets to the next one?

It would seem that quantum theory presents us with an insurmountable paradox. Clearly, electrons do make the jump, and they must have an existence between the levels, and therefore the theory must be in error.

Quantum leaps

But given the many decades of overwhelming evidence of the theory's correctness, there is only one solution to this paradox, however counterintuitive it might appear: The electron in question disappears from one energy level and reappears in another at the exact same instant. The amount of time that passes in the interim is zero. Not virtually, nearly or essentially zero, but *actually* zero.

Still going on the same assumption, what we have is a switch that changes state instantaneously. And a gang of them properly coupled would constitute a set of quantum flip-flops that, with an appropriate stimulus, would all switch at the same time. And this would allow for the execution of a computer instruction — or a billion instructions — with no passage of time at all.

This is a tad faster than gallium arsenide or even quantum transistors.

Could it be built?

But would it be possible to actually construct a device based on quantum transitions like those that occur at the energy level of individual electrons?

At the very least, there are two major problems with such single-particle switches. The first involves trying to figure out at what state transition actually occurs. The second is how to keep every stray subatomic particle in the neighborhood from wiping out the data.

In order to determine whether a state transition has occurred — or, more conventionally, whether the bit is on or off — a measurement must be made. And in order to make a measurement, energy must be imparted to the thing being measured, whether it is an atom, a pint of milk or a planet.

Further, in order for this energy not to unduly disturb the thing being measured, the energy added must be small in relation to it. For example, if you try to weigh the milk by monitoring its inertial resistance to being hit by a cannonball, you will likely disturb the milk to the point where it will upset your results. The energy of the cannonball is large in comparison to the pint of milk being measured. Setting the milk gently on a scale ensures that the energy imparted during the measurement is relatively small.

Another example is bouncing lasers off the moon to measure its distance. The laser light hitting the moon disturbs its orbit and thus changes its distance from the earth, but this is a small effect compared with the results we seek. Thus, in the macro world, measurement is generally not a problem.

The problem at the quantum level, however, is that the thing being measured is, by definition, quantized and already represents the lowest possible energy. Therefore, any energy imparted must necessarily change the state and ruin the measurement.

If we use a large amount of energy to do the "read," we overwhelm the quantum state to such a degree that we cannot isolate the effect we were trying to measure. If we try to use a single quantum of measurement, we are left with the problem of trying to determine the new state of the measuring quantum, which is the same as our original problem, and we can cascade this back, ad infinitum, without

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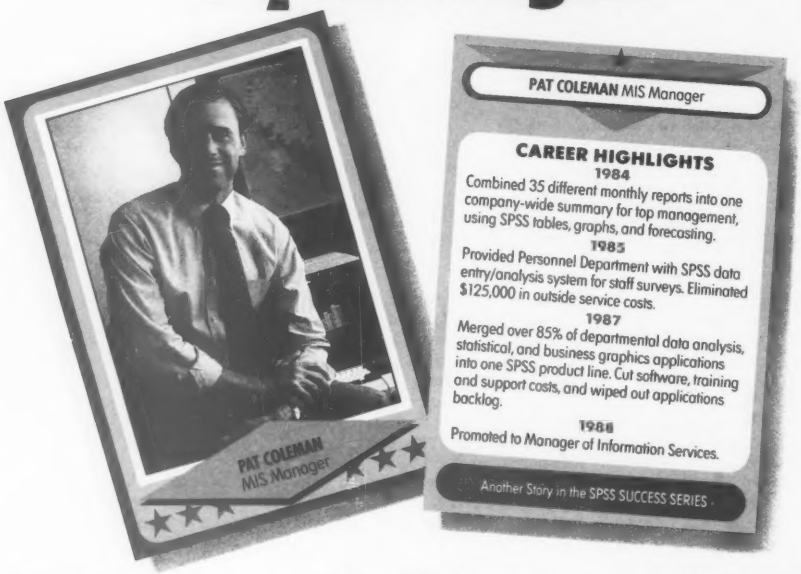

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But what if we use only a slightly larger amount of energy — just enough to affect the quantum state, but predictably, so that we do not blank out the effect we are trying to measure? Even in many types of conventional random-access memory, the measurement (the read) does, in fact, disturb the state of the bit being measured: It reverses it. The traditional solution is to flip the bit back after every read, thus preserving the initial state. The ability to do this is based on the precisely deterministic way the conventional field effect transistor behaves, depending as it does on classical physics.

But at the quantum level we are dealing with quantum reality, and that brings us to the heart of the measurement problem.

According to quantum theory, what we know as pure determinism breaks down at the individual particle level. While we know a great deal about the behavior of large numbers of particles, it turns out that we know less and less as the number of particles gets smaller and smaller until, at the level of the quantum, we are left with nothing but a distribution of probabilities.

THE FACT that 50,000 people will die on the roads next year tells you absolutely nothing about what will happen to you the next time you get into your car.

Consider the following analogy: The fact that 50,000 people will die on the roads next year tells you absolutely nothing about what will happen to you the next time you get into your car.

In the same way, we know with a great deal of precision the probability of an electron behaving a certain way under a certain set of initial conditions. Because of the Correspondence Principle — which states that quantum physics reduces to classical physics as things get larger and more particles are involved — given enough electrons to start with, there will be no doubt of the overall outcome at a macro level of a subset of the electrons. But according to well-established quantum mechanical principles, we can never predict with certainty the behavior of any one particle.

This is not because we lack information about the starting conditions. Nature itself doesn't know what any particle is about to do because it is inherently unknowable.

For a macro device such as a quantum transistor or a Josephson junction, this is of no consequence because relatively large numbers of electrons are involved and because we don't care which ones get through as long as some do. The price we pay for this certainty is finite switching time.

For an instantaneous switch based on an individual particle, however, this is a serious problem. The very basis of its existence guarantees its unreliability.

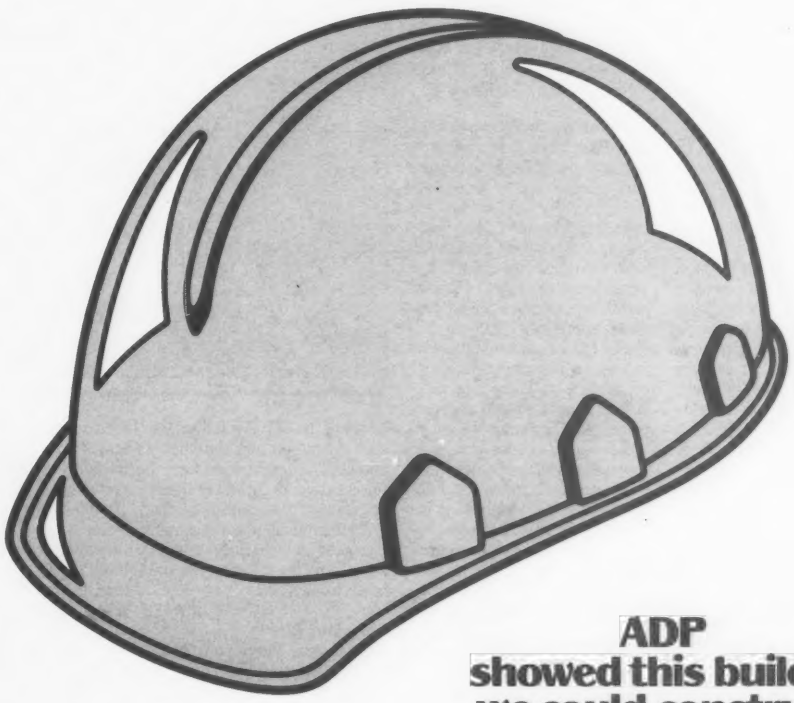
Strange invaders

The second major problem in building a quantum device — how to keep stray subatomic particles from wiping out the data — is a little less esoteric. The trouble is that the universe is a fountain of subatomic particles. They are everywhere.

And in the macro scheme of things, few of them are of much consequence. But in our quantum computer, they are a disaster. At the subatomic level, inevitable collisions guarantee random change.

Shielding will not help. One of the strangest predictions of Heisenberg's Uncertainty Principle is that pairs — never singles — of particles can arise spontaneously from a vacuum, travel for a short distance and then annihilate each other. There is no protection from these for our unwary single-particle switch if it happens to be in the way.

It appears that building a usable switch based on single-particle state transitions is a fundamental natural impossibility. Does this mean that we are



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forever precluded from building a computer that relies on instantaneous quantum jumps? Not necessarily.

Enter the macroatom

A group of scientists in England has succeeded in creating a device that in some ways mimics a quantum particle. It is a superconducting ring that is pinched extremely tight at one point, effectively forming an "electromagnetic resonance cavity," much like the quantum well.

As in the quantum well, the motions are represented by standing rather than traveling waves, and only certain wavelengths — or frequencies — can now exist: The quantization of the wavelength results from the confinement of the wave.

Even more important, the "cylindrical symmetry" caused by the tight constriction makes the electron wave within the ring behave like a single quantum particle.

It turns out that any magnetic flux applied along the axis of the cylinder causes quantized energy-state transitions within the ring in a periodic manner. Since the wave acts as a single quantum particle, the entire transition takes place at one time everywhere in the ring, regardless of where the stimulus is applied.

This would appear to be impossible, as it violates the most basic tenet of relativity — namely, that nothing can travel faster than the speed of light. However, since no one has yet successfully integrated relativity with quantum mechanics, there is no good explanation for this discrepancy just yet. Nevertheless, the experimental results speak for themselves.

Terry Clark, head of cryogenic studies at the University of Sussex in England, calls this quantum simulating device a "macroatom." It appears that, operating as it does at the macro level and thus exploiting the Correspondence Principle, the device is not only reliably deterministic but also allows for unambiguous detection of the state transition, thereby solving both measurement problems.

It would also seem that multiple macroatoms can be coupled in such a fashion that a state change in one triggers a simultaneous change in all the others. Whether it will be disturbed by the random intrusion of stray subatomic particles is yet to be determined.

Rethinking programming

Assuming that it is ultimately possible to fabricate hardware that incorporates the concepts of quantum theory, we are still left with a small problem: How do we design and program a computer with a zero execution time? Is it possible, for example, to depend on the state changes of linked devices that involve no delay between the outcome of one state change and the onset of the next?

It might be. There is no theoretical barrier to one quantum transition triggering a second and then a third, even though no time passes after the detection of the original stimulus. A problem does arise, however, if we try to circle back to any macroatom that has already been used for this particular "program."

We have made the assumption that, since macroatoms only simulate quantum transitions and do so at relatively large energy levels, the measuring process will likely not change the state in an indeterminate manner. Thus, we can probably construct a group of serially linked operations that execute in zero time.

However, if we try to reuse a macroatom that we have already used in this particular zero-time operation, that macroatom will be making two (or more) state transitions at the same time. There is no way to tell which state the macroatom is in when a particular sequence needs it, since, essentially, it will be in every state at the same time. To avoid this difficulty, our quantum computer design must ensure using only "fresh" macroatoms for each operation.

Finite but fast

An inelegant but pragmatic alternative to the requirement of using fresh macroatoms is to deliberately slow the machine down by introducing a small but finite delay between state transitions. This could be done by separating the macroatoms with tiny "repeaters" that act like microwave transmission towers, detecting one phase transition and retransmitting it to the next macroatom. A simple conducting wire might work if the macroatoms were fabricated appropriately. This would result in a machine that was conventional with respect to execution logic.

So far we have been talking about binary switching at the lowest level. It takes many switches to construct a typical computer instruction. Even if we wish to slow down the quantum computer to let us take advantage of conventional logic — that is, with serially executed instructions — there is no reason why each individual instruction cannot be executed in zero time.

Instead of connecting individual macroatoms with repeaters, we would connect groups of macroatoms, with each group constituting an instruction. Each instruction group would be built as a row of macroatoms, and the rows would be laid side by side, separated by repeaters. Execution of a group of instructions would proceed across the rows (see diagram below).

Assume that each instruction group was 0.5 millionths of a meter wide and separated from the next group by a repeater of the same width — any smaller, and not only might we be unable to fabricate the required macroatoms but we might also risk reintroducing measurement uncertainty. This would result in 10,000 devices per linear centimeter.

Since each instruction group theoretically switches in zero time, the total time to carry out a set of operations would be a function of the speed with which a signal could traverse the repeaters. At one-half the speed of light — which is a more than reasonable propagation speed in a wire — our quantum chip would have an effective compute power equal to 150 trillion instructions per second.

A remaining problem is that this design is not easily programmable: The instructions are fixed in position and would make good read-only memory but bad random-access memory. Even if we lose a full order of magnitude in the redesign, however, we still end up with a machine that is 1½ million times more powerful than IBM's fastest general-purpose computer, the 3090 Model 600S.

Note, too, that each individual instruction group could be a good deal more powerful than a computer instruction of today.

Functional difference

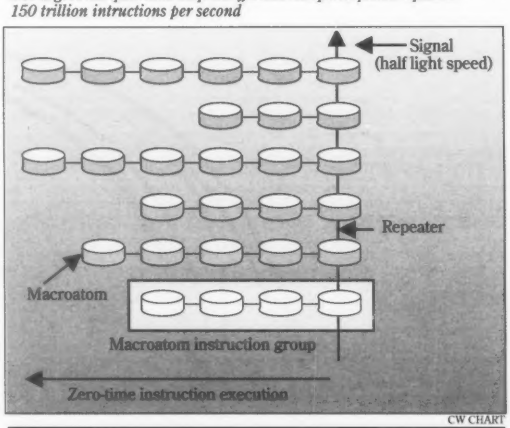
Whereas reduced instruction set computing technology is based on gaining speed by simplifying the task of each instruction, the goal in the zero-time instruction would be to maximize the functionality of each instruction group, since there would be no execution time penalty whatsoever. The limit on this maximum instruction set computing machine is how much can be done without reusing any macroatoms within an instruction.

When will we see one of these machines? Speculation is risky; technological barriers seem to fall within weeks after they are declared impenetrable — witness high-temperature superconductors. Others seem to defy breakthroughs with frustrating tenacity — like natural language processing.

The possibility of a quantum computer has been reinforced by isolated developments, but it has a long way to go. Even so, one thing is likely: If sufficient theoretical groundwork is laid to persuade the commercial world that this device is possible, the race will be on at an intensity level never before seen in the computer industry. •

Proposed configuration of the quantum chip

Purposely introducing a slight delay beween zero-time instructions would give the quantum chip an effective computer power equal to 150 trillion intructions per second



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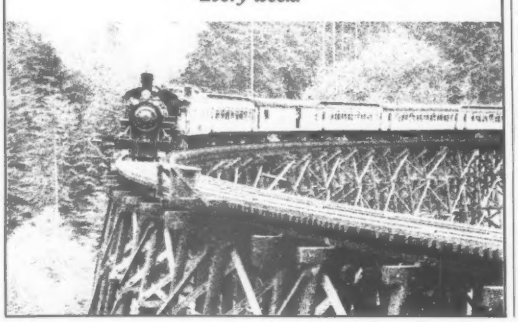

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Work already under way

Quantum transistor basis for next gains in efficiency

There is already work under way to try to harness quantum effects for computing applications. While not approaching the proposed quantum computer in zero-speed instructions, the quantum transistor currently in the research lab is an important step in exploiting the useful features of the subatomic world. It is fundamentally different from the conventional transistor.

The invention of the conventional silicon transistor ranks as one of the truly monumental achievements of modern technology, even though it uses purely classical — that is, nonquantum — physics for its operation.

The modern, conventional silicon transistor consists of a source of electrons on one side and a drain on the other, separated by a channel. The trick is to get the electrons to flow from the source to the drain, which they normally would not do because the channel does not conduct electricity very well. That's why it is called a "semiconductor."

When a third terminal, known as the gate, is placed on top of the channel and a small positive voltage applied, electrons in the channel will be attracted to the gate and will cluster underneath it. This forms a path, known as an inversion layer, along which the electrons from the source can flow to the drain. A current is now set up (see diagram above).

Remove the voltage from the gate and the inversion layer collapses, breaking the path. The current stops. Thus, the application of a small voltage allows for the control of a large current and we have a very fast switch with no moving parts — hence the term "solid-state."

A gallium arsenide (GaAs) transistor works a little differently. The channel allows electrons to flow freely between the source and the drain when there is no voltage on the gate. In order to stop the flow, negative voltage is applied to the gate, which repels the electrons underneath it in the channel. This destroys the path and stops the flow of electrons. There is no advantage to this technique except that the lag between the moment the gate voltage is changed and the time a change occurs in the current is much shorter than in the silicon device. Thus, the GaAs transistor is a faster switch.

Both devices are referred to as field-effect transistors (FET). While they are extremely effective, there are some limits on how small they can be and still work. Texas Instruments, Inc. scientist Robert Bates has pointed out that the smaller the FET gets, the worse it switches.

Bates' team is working on a solution to this problem by turning to quantum physics. Their investigations center on attempts to exploit quantum effects in order to reduce the size and increase the speed of switching devices. It is not necessary to isolate individual subatomic particles in order to do this because of the "quantum well," a construct that uses energy barriers to confine electrons to a very small space.

If electrons can be confined closely enough within energy levels, they start to look more like waves than particles. And if the confinement is properly tuned, the electron waves bouncing back and forth between the barriers will line up so that the peaks of the waves going one way meet peaks going the other way, and constructive interference occurs. More correctly, the probability waves of the electrons overlap and increase the chance of finding electrons at the peaks.

At the proper tuning voltage (that is, the voltage that induces resonance in the well), there is a sudden and pronounced increase in what is known as tunneling current (see diagram right). At other voltages, because nothing can happen in between the well-defined quantum levels, there is no such current. These highly isolated peaks in current constitute a switch that not only is very small, but could not even exist if it were any larger. Also, because of the rapidity of the jumps between quantum levels, the switch is extremely fast, even though it is made up of groups of electrons rather than just one.

The quantum well results from confinement in energy, not physical, barriers. In order to give rise to these energy barriers, the actual working core of the physical device would be about two millionths of a centimeter in all three dimensions.

Even allowing for sufficiently massive surrounding substrate to permit connection of "wiring," it is easy to see that this technology would permit functional chips of extraordinary density. If each device were 100 billionths of a meter square, a one-centimeter-square chip could hold 10 billion quantum transistors *per layer.*

Known quantity

The quantum well is an established technology base. Scientists at the University of California at Los Angeles have used it to develop a semiconductor that is 100 times more sensitive to light than any other. The chip is to be used in the coming generation of optical computers. In it, electrons, normally free to roam inside a crystal, are trapped between very thin layers that form a quantum well. This confinement limits the energy states in which electrons can reside and renders them much more susceptible to specific frequencies of light — in this case the exact frequency of a gallium arsenide laser.

Scientists at AT&T Bell Laboratories are working on a quantum well heat detector that uses the same principles.

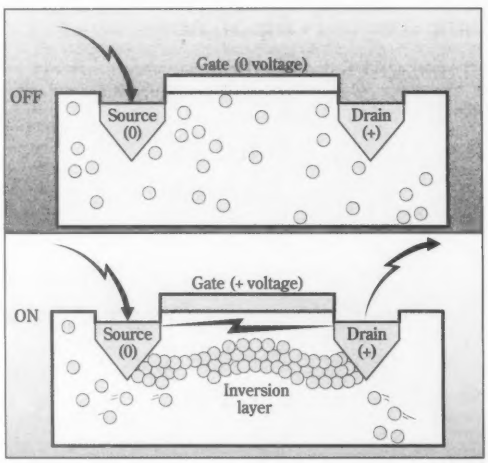
Like conventional FETs, quantum transistor-based switches would still be three-terminal devices consisting of a source, a gate and a drain. While this might somewhat simplify the logic of circuit design, the electrical features are completely different: The FET-based circuit depends on the presence or absence of any voltage to control current, while the quantum transistor depends on specific voltages to induce resonance.

The quantum transistor could speed up conventional computing enormously. But by whatever order of magnitude it does that, keep in mind that the quantum computer would dwarf even this achievement.

LEE GRUENFELD

A typical silicon transistor mechanism

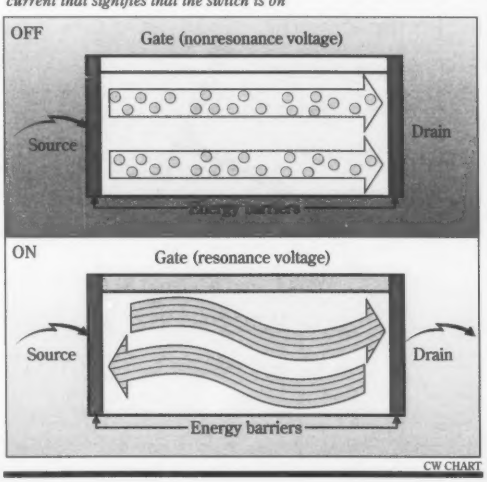
When there is no voltage on the gate, the switch is off; when a small positive voltage is applied, a path for the current is set up, and the switch is on



CW CHART

The quantum transistor mechanism

In this extremely small quantum-well switch, the proper (resonance) voltage produces pronounced peaks in the electron waves, creating a current that signifies that the switch is on



CW CHART

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MANAGEMENT

TAKING CHARGE

James Connolly

Dealing with the other side

The transition is well documented. People with general business experience are moving into information systems management positions, while middle-level managers are shifting from information systems into the business community.

What remains to be seen is the long-term impact of the trend. Will the transition be as smooth as ships passing in the night? Or maybe IS and general business will end up like the luxury liners *Andrea Doria* and *Stockholm* — "Crunch!" "Man the lifeboats!"

This trend stems from the legitimate need for people in information systems to learn more about the general business world. The concept of technologists having to become better businesspeople has been one of the hot ideas of the past few years, and anyone who rejects it probably hates apple pie and his mother. But for all of its merit, the trend also raises questions about long-term problems — none of which should be insurmountable.

One of the initial dangers lies in the idea of shipping talented middle managers from the information systems group out to the user community with the mandate of getting to know the business' goals and needs. They are systems developers sent out to act as liaisons between IS and the user community, thus ensuring that new

Continued on page 116

Training for AS/400 can be a rocky climb

BY ALAN J. RYAN
CW STAFF

Moving your System/34, 36 or 38 programs to the Application System/400 platform will be a straightforward process, according to IBM. But while some MIS managers concur with this position, others say the path more closely resembles a convoluted mountain trail — and the mountain-climbing gear is expensive.

Users of IBM's popular System/36 series interviewed recently said what is certainly a worthwhile move to the IBM AS/400 will bring its share of problems, including training issues, before they will see its full potential.

"It will take the System/36 users six months to fully adapt to the AS/400," said consultant Keith Okano, director of research and development at Automated Training Systems in Woodland Hills, Calif. The firm offers courses on the AS/400 that range in price from $700 to $900 for a 40-hour course.

Okano said that while the AS/400 was designed so people can begin to be productive within the first few days, to function in a true AS/400 environment is going to take a combination of on-the-job experimentation and training. All of the managers contacted agreed that on-the-job training will supplement any classroom training.

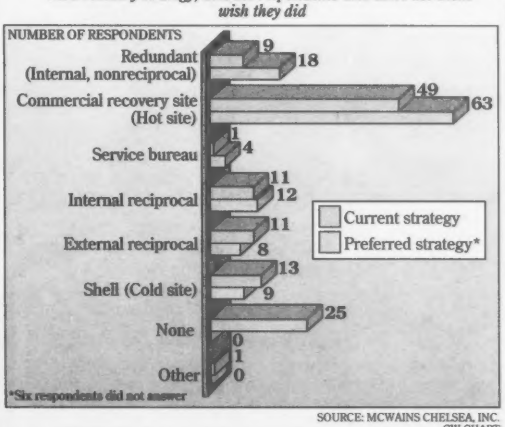
In Orange County, Texas, data processing manager Phyllis Boudreaux has been making the transition from the county's System/36 to the AS/400 for a month, and she is signing up for many of the educational classes

Continued on page 114

Data View

Room for recovery

Among 120 organizations polled, hot sites are the most widely used recovery strategy, and the respondents who don't use them wish they did



SOURCE: MCWAINS CHELSEA, INC.
CW CHART

'A lot to get done'

Khanna takes on CIT Group systems challenge

BY GLENN RIFKIN
CW STAFF

When 21-year-old Kailash Khanna left his home in Delhi, India, to acquire a master's degree at Columbia University in New York, he had every intention of returning home upon graduation. Twenty-nine years later, Khanna has never gotten around to moving back. He has, quite simply, been too busy shaping a career as a leading information systems executive.

Khanna, a soft-spoken 25-year information systems veteran, raised more than a few eyebrows when he left his post as vice-president and head of corporate systems and technology at American Express Co. to join the troubled CIT Group in May. How could he leave such a prestigious spot in the glamour of downtown Manhattan, industry watchers wondered, for the relatively obscure asset-based financial institution headquartered in the New Jersey suburb of Livingston?

For Khanna, the decision was hardly difficult. After nine years in a corporate staff job at American Express, he was itching for a new challenge. Despite talk that something must be wrong at American Express, Khanna says he simply wanted to move from a staff job to a line position.

Though influential at American Express, he was relegated to a strategic overseer's role there. His task had been to decentralize systems into the company's four major business units, and he had done that over the course of four years — perhaps too well.

Just too good

"Kailash essentially worked himself out of a job," says Howard Clark Jr., executive vice-president and chief financial officer at American Express. "He did a terrific job of decentralizing the information systems function, and in the end what was left in corporate headquarters was not significant enough or important enough for a man of his skills."

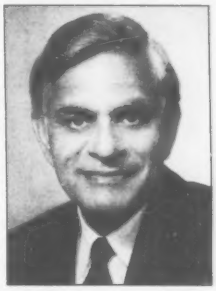
Khanna wanted total responsibility for the delivery of technology. CIT, a subsidiary of Manufacturers Hanover Trust, gave him that chance.

After careful thought, Khanna accepted the offer to become senior vice-president in charge of information systems, data processing and telecommunications. "In terms of employee count and asset size, it may seem like a move down. But in terms of my leverage and influence on the business, it is significantly greater," Khanna says.

Before American Express, Khanna spent extended stays with Trans World Airlines and American Airlines, where he

Continued on page 118

PROFILE
Kailash Khanna



Position: *Senior vice-president for information systems, data processing and telecommunications, CIT Group.*
Philosophy: *"You go where there is tremendous need, where there is a lot to get done. That's where the greatest challenge is."*

Tax units tap computer's potential

BY JAMES CONNOLLY
CW STAFF

NEW YORK — One of the sectors making particularly good use of computers within the typical big corporation is the tax department, according to a study by Peat, Marwick, Main & Co.

The Big Eight accounting firm's recent survey of 414 Fortune 1,000 companies found that 60% of those respondents have computerized more than half of their tax department functions and that one-third have automated more than 70% of them.

Those tax departments reported that they are pleased with the automation efforts and are relying more on microcomputers.

"This study underscores just how successful and how widespread the integration of computers into tax work has been. The principal reasons cited for purchasing computers were anticipated improvements in productivity [87%], meeting an increasing volume of work [82%], improving accuracy [79%] and keeping pace with the complexity of changing tax laws [56%]," said David C. Smith, vice-chairman of Peat Marwick's tax practice, in announcing the results.

"The fact that two-thirds of the respondents have achieved ratios of one or two tax professionals per microcomputer attests to both the magnitude of productivity gains and the willingness of corporations to continue to invest in hardware as a result of initial successes," Smith added.

Feeling satisfied

In the satisfaction portion of the survey, 94% of the companies said their tax departments are realizing or exceeding anticipated gains in productivity from computerization. When they were asked whether they had met or exceeded expected gains in quality, the satisfaction level reached 97%.

Peat Marwick found the most significant problem tax departments faced in using computers was the loss of data files because of operator error (47%) or equipment malfunction (30%). But more than 80% of the respondents still do not back up their data daily, and nearly 30% have no backup policy at all.

The study found that likely growth areas within tax department automation are the use of personal computers and multitasking systems software such as Unix, IBM and Microsoft Corp.'s OS/2 and Xenix.

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PLUG COMPATIBILITY
MULTI HOST
PERSONAL COMPUTERS
MULTI SESSION
MULTI SESSION
MULTI SESSION
MULTI SESSION
COMPUTERS
ASYNC PROCESSORS
SYSTEM
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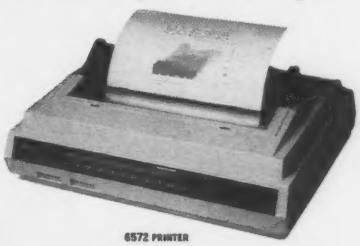

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AS/400

CONTINUED FROM PAGE 111

offered by IBM to supplement the in-house work.

Still, Boudreaux said, the transition is time-consuming, difficult and expensive. She estimated the cost of the training her two programmers have received so far to be $3,000. The migration aids cost more than $500 each, she added.

Boudreaux's programmers were first shipped off to school to learn the System/38 mode, which is the environment that most closely resembles the AS/400 mode. That training will make the transition easier, she predicted. In total, the programmers have received nearly three weeks of training through IBM, but they are not finished yet. Later, she will send them back to school to learn the subtle differences between the System/38 and the AS/400 technology. Those additional AS/400 programming workshops and classes will cost approximately $5,000 more, she estimated.

Diane DeLaurier, manager of distributed systems at Ryder Truck Rental, Inc. in Miami, which plans to purchase approximately 100 AS/400s, said she has been holding in-house training courses for her System/36 programmers to gear up for the AS/400s. The instructors are IBM personnel and in-house people who have been through the formal IBM training.

While Ryder has experienced some problem in moving programs to the AS/400, that could be because most of the company's programs are written in Cobol rather than RPG, DeLaurier said.

DeLaurier said Ryder is easing the training burden by sending a small group of programmers to classes. Those employees have been helping to train other programmers.

"They came back, looked at our applications and how they were coded and put together our migration cookbook," which identified how things were done on the System/36 and how they would be done differently on the AS/400, DeLaurier said. Each programmer was given a cookbook as a reference when learning the AS/400. "We felt that, by and large, when they sat down, they were fairly productive," she said.

A road less traveled

At the United Way of the National Capital Area in Washington, D.C., MIS Director John Walter has faced an even stiffer challenge — moving from the old, 1974-vintage IBM System/3 Model 15D to the AS/400. "We have to go from the System/3 to tape, and then tape through the 38 with the migration aid to the AS/400." That meant training his programmers in the System/38's RPG III to accustom them to RPG 400, he said.

Like most of the managers interviewed, Walter said his crew would not be immediately working in AS/400 mode. Instead, he will move the programs over in the System/38 mode and then gradually convert them.

Surprisingly, System/38 technology is crucial to the AS/400 conversions even for those migrating from the System/36 and its predecessors. "Even though we'll be running the AS/400 in System/36 mode," Orange County's Boudreaux said, "we'll have to use some 38 technology in order to get it to run properly."

For its part, IBM is offering a slew of courses for AS/400 training. Courses range from half-day tutorials for programmers making the easy migration from the System/38 to more complex classes for System/36 programmers to high-level classes for users planning to use the AS/400 for communications.

"We expect when a student leaves our course, he'll be productive," said Avis Hodge, an IBM System/36 and 38 curriculum planner in Atlanta. IBM's course offerings range in price from $75 for certain half-day courses to $1,500.

As expected, the switch is a fairly smooth one for System/38 programmers, the MIS directors interviewed said. In many cases, the manuals IBM supplied with the AS/400 and the optional migration utility will be all that those programmers require, managers said.

"As far as I'm concerned, it should be a smooth transition" from the company's System/38 to the AS/400, said Steve Poppe, vice-president of MIS at Roto Rooter Services Co. in Cincinnati. "We've run the command-program languages through the migration aid and found programs that would not translate, but the basic RPG programs converted right over," he said.

Roto Rooter has purchased eight AS/400 Model 10s that will be put in remote company sites across the country and will be the slaves to the AS/400 Model 30 at Roto Rooter headquarters in Cincinnati. Poppe said he expects that 90% to 95% of the commands will be easily translated from System/38 to AS/400 commands. The system should be up and fully functional in seven to eight months, he added.

IBM has provided extensive documentation with the hardware, the programmers said, and this might be enough for sophisticated programmers. Marshall Morrow, president and chief programmer at Technical Construction, Inc. in Alexandria, Va., is making the AS/400 migration from an IBM System/34 to the AS/400, but he expects few snags.

"I haven't seen anything about native CL or native RPG that frightens me," Morrow said. "I came from a System/3 to a System/32 with the manuals and from the 32 to the 34 with the manuals, and I intend to the do the same this time."

Senior Editor Rosemary Hamilton contributed to this report.

How smart planners have turned the Bell break-up into a significant strategic advantage:

CALENDAR

OCT. 16-22

Adapso Management Conference. Dallas, Oct. 16-19 — Contact: Adapso, Suite 300, 1300 N. 17th St., Arlington, Va. 22209.

Society for Information Management Annual Conference: Breaking Out of the Mold. Minneapolis, Oct. 16-19 — Contact: Society for Information Management, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

Network Management. Chicago, Oct. 17-18 — Contact: Frost & Sullivan, Customer Service, 106 Fulton St., New York, N.Y. 10038.

ACM SIGDOC '88 International Conference on Systems Documentation. Ann Arbor, Mich., Oct. 17-19 — Contact: Tec-Ed Technical Publications and Graphics Services, P.O. Box 1905, Ann Arbor, Mich. 48106.

American Bankers Association Workshop on Point-of-Sale Systems. Boston, Oct. 17-19 — Contact: American Bankers Association, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

Hammer Forum 88. Boston, Oct. 17-19 — Contact: Hammer and Co., Five Cambridge Center, Cambridge, Mass. 02142.

ISHM '88: Erupting Innovations in Microelectronics. Seattle, Oct. 17-19 — Contact: International Society For Hybrid Microelectronics, P.O. Box 2698, Reston, Va. 22090.

Semiconductor Industry Conference. San Diego, Oct. 17-19 — Contact: Dataquest, 1290 Ridder Park Drive, San Jose, Calif. 95131.

National Computer Security Conference. Baltimore, Oct. 17-20 — Contact: Linda Muzik, Attn: S931, National Security Agency, 9800 Savage Road, Fort George G. Meade, Md. 20755.

Usenix, C++ Conference. Denver, Oct. 17-20 — Contact: Usenix Conference Office, P.O. Box 385, Sunset Beach, Calif. 90742.

Electronic Printer & Publishing Conference Series. San Jose, Calif., Oct. 17-21 — Contact: Cap International, One Longwater Circle, Norwell, Mass. 02061.

National Conference on Network Management. Myrtle Beach, S.C., Oct. 17-21 — Contact: Applied Computing Devices, Aleph Park, 100 N. Campus Drive, Terre Haute, Ind. 47802.

Transnational Forum on Standards. Reno, Nev., Oct. 17-21 — Contact: Addy Zeni, Forum Coordinator, IEEE Headquarters, 345 E. 47th St., New York, N.Y. 10017.

Use, Inc.'s Fall Conference for Users of Unisys 1100 Series Computers. Louisville, Ky., Oct. 17-21 — Contact: Use, Inc., Box 461, Bladensburg, Md. 20710.

Strategies for Customer Support. Newton, Mass., Oct. 18 — Contact: International Data Corp., 5 Speen St., Framingham, Mass. 01701.

Dexpo West 88. Anaheim, Calif., Oct. 18-20 — Contact: Expoconsul International, 3 Independence Way, Princeton, N.J. 08540.

Association of Federal Information Resources Management Seminar: "IRM, Making It Happen." Washington, D.C., Oct. 19 — Contact: AFFIRM Seminar, P.O. Box 12812, Arlington, Va. 22209.

Catalyst User Forum. Chicago, Oct. 19-20 — Contact: Catalyst, Peat Marwick, Main & Co., 303 E. Wacker Drive, Chicago, Ill. 60601.

Vardex: Value Added Reseller and Dealer Exposition. Dallas, Oct. 19-20 — Contact: Hugh F. Macgregor & Associates, 2421 Monroe, Dearborn, Mich. 48124.

Network 90's. San Francisco, Oct. 19-21 — Contact: U.S. Telecommunications Suppliers Association, Suite 600, 150 N. Michigan Ave., Chicago, Ill. 60601.

Office Products Exchange Network Fall Conference. Dallas, Oct. 19-21 — Contact: Steve Oliver, OPEN, c/o ICOT Network Systems Division, P.O. Box 91395, Mobile, Ala. 36691.

CDLA/ECLAT Annual Meeting. Boston, Oct. 19-22 — Contact: Computer Dealers and Lessors Association, 1212 Potomac St. N.W., Washingtpon, D.C. 20007.

Fall Conference of the Society of Telecommunications Consultants. Cambridge, Mass., Oct. 19-23 — Contact: Balboa Travel, Group Department, P.O. Box 84779, San Diego, Calif. 92138.

Invitational Computer Conference. Bloomington, Minn., Oct. 20 — Contact: B. J. Johnson & Associates, 3151 Airway Ave., C-2, Costa Mesa, Calif. 92626.

Plantrac Users Group of North America Conference. Plymouth, Mass., Oct. 20-21 — Contact: Rob Edwards, Computerline, 52 School St., Pembroke, Mass. 02359.

Open Protocols Symposium. Atlanta, Oct. 21 — Contact: The Association of Energy Engineers, Suite 420, 4025 Pleasantdale Road, Atlanta, Ga. 30340.

OCT. 23-29

Project/2 Utility Users Group Conference. Hyannis, Mass., Oct. 23-26 — Contact: Project Software & Development, 20 University Road, Cambridge, Mass. 02138.

UFO-Cobol/XE Users Group Annual Meeting. New Orleans, Oct. 23-26 — Contact: Lisa Jones, Users Group Manager, On-Line Software, Fort Lee Executive Park, 2 Executive Drive, Fort Lee, N.J. 07024.

Common, Fall '88 Conference. Toronto, Oct. 23-27 — Contact: Common Headquarters, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

Electronic Messaging '88. Boston, Oct. 24-25 — Contact: Electronic Mail Association, Suite 300, 1919 Pennsylvania Ave. N.W., Washington, D.C. 20006.

Network Users Group AT&T (NUGATT). Washington, D.C., Oct. 24-25 — Contact: Bob Jones, Bechtel Power Co., Mail Stop 1E3, 15740 Shady Grove Road, Gaithersburg, Md., 20877.

Expert Systems Symposium. New York, Oct. 24-26 — Contact: Digital Consulting, 6 Windsor St., Andover, Mass. 01830.

Profiting From Strategic Information Management. New York, Oct. 24-26 — Contact: Institute for International Research, 331 Madison Ave., New York, N.Y. 10017.

Conference on Software Maintenance. Phoenix, Oct. 24-27 — Contact: Dr. Robert S. Arnold, CSM-88 General Chair, Software Productivity Consortium, 1880 Campus Commons Drive N., Reston, Va. 22091.

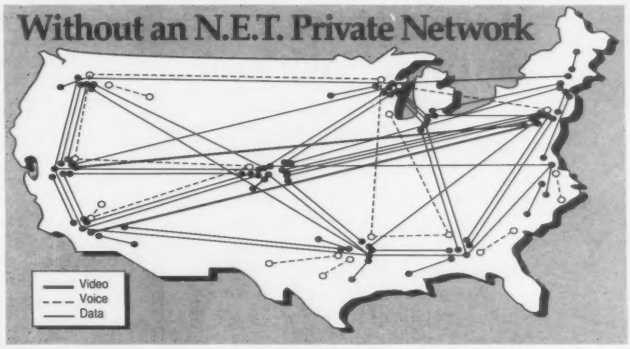
Microbanker Expo '88. New Orleans, Oct. 24-27 — Contact: Microbanker, P.O. Box 1508, York, Pa. 17405.

Annual Meeting of the Human Factors Society. Anaheim, Calif., Oct. 24-28 — Contact: Human Factors Society, P.O. Box 16502, Irvine, Calif. 92713.

Federal Computer Conference and Defense and Government Computer-Graphics Conference. Washington, D.C., Oct. 24-28 — Contact: National Council for Education on Information Strategies, P.O. Box 41045, 7315 Wisconsin Ave., Bethesda, Md. 20814.

Continued on page 116

Private networks.



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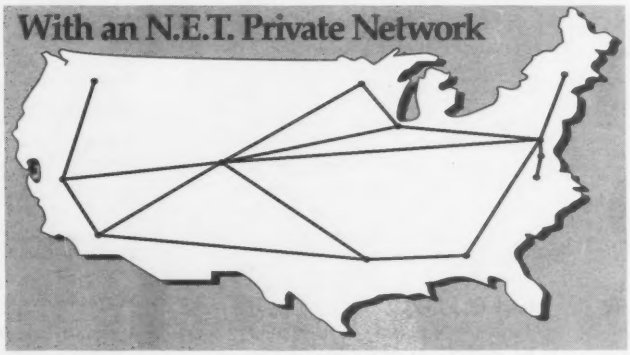

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Connolly

CONTINUED FROM PAGE 111

systems address the company's needs as far as function and prompt delivery are concerned. That is a great idea, and plenty of companies are implementing it today. However, the danger may be that the participants in that program may never come back to the IS group.

Therefore, the IS executive must be prepared to accept that loss of talent by offsetting it with the benefit of having IS-educated managers in the user community, or the executive must find a way to attract that manager back from the user side to IS a couple of years down the road.

The challenge for the executive may lie in making IS and its growth path attractive enough to draw that manager back from the promise of a career in the user community and rewards such as the glamour of marketing and the cash in the sales department.

It means the corporation has to say that a manager who understands IS and understands the business can become chief information officer and can go from there to chief operating officer or president.

If all of this sounds like an executive rotation proposal, it is. However, when young executives and managers are rotated into IS, it must be with the understanding that they are doing more than putting in their time in computers. One of the mistakes some companies have made has been to rotate talented people into the IS group but only in general management capacities such as human resource manager for that group. Those developing executives must learn about IS from the inside and contribute to the group by using the experience they have gained in other departments.

Shut out

Another long-term problem associated with the mix of IS and the business side can hit near the top of the IS organization, with qualified IS managers being shut out of the top job because the company insists on bringing in a person with general business experience. That policy has worked well in many companies recently, as the general manager brings to IS a fresh outlook and the ability to ask what-if questions more easily than a person with a lifetime of technical experience and technical biases. The person who was brought in is then better prepared for the high-ranking positions in the executive suite.

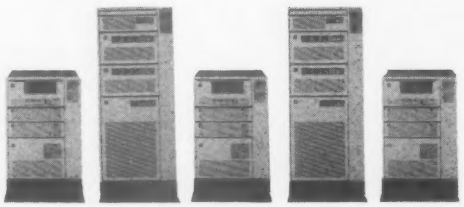
The irony is that the IS manager who is passed over for that top job is not considered for top jobs in other departments simply because he or she came up through IS. That manager faces the prospect of being stuck at a plateau within IS, making a lateral or even downward transfer into another department and trying to climb another ladder, or making a lateral or downward move into another company.

There is also a danger in bringing too many general business people into top IS jobs, particularly if a company replaces each of those top executives after two years — just when an executive has come to understand some of the technology — with another computer neophyte.

The doors between IS and the general business side must swing both ways. The two groups have to be brought closer together, but only through relationships that benefit each side and, as an end result, the company as a whole.

That means that people who work in IS need a growth path, not only within the ranks of IS but to the company president's office. It means that people rotated into IS have to make it what people in the 1970s called "a meaningful experience." It means that people who are rotated out of the systems group have to remember where they came from. Finally, it means that people who have spent all of their adult lives in IS have to gain exposure to the rest of the company, set aside their vendor biases and "it can't be done" attitudes and remember that they work for the company, not for the computer.

Connolly is *Computerworld*'s senior editor, management.



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Stanford Resources Flat Information Display Conference and Exhibition. Santa Clara, Calif., Oct. 25-26 — Contact: Murray Disman, International Planning Information, 465 Convention Way, No. 1, Redwood City, Calif. 94063.

Annual Tradeshow & Conference. Boston, Oct. 25-27 — Contact: Laser Active, P.O. Box 2401, Satellite Beach, Fla. 32937.

Seybold Executive Forum. Cambridge, Mass., Oct. 25-27 — Contact: Seybold Executive Forum, Patricia Seybold's Office Computing Group, Suite 612, 148 State St., Boston, Mass. 02109.

Educom'88, Campaign for Excellence: Education, Government, Industry. Washington, D.C., Oct. 25-28 — Contact: Educom'88, P.O. Box 364, 777 Alexander Road, Princeton, N.J. 08540.

Systec 88: International Trade Fair for Computer-Integrated Manufacturing. Munich, West Germany, Oct. 25-28 — Contact: VDI Society for Development, Design and Marketing, Postfach 11 39, 4000 Dusseldorf 1, Federal Republic of Germany.

DB2/SQL Seminar. New York, Oct. 26 — Contact: DB2 & SQL/DS Users Bulletin, P.O. Box 560, New York, N.Y. 10005.

Tape Storage Forum. Sunnyvale, Calif., Oct. 26-27 — Contact: Technology Forums, Suite 260, 80 W. 78th St., Chanhassen, Minn. 55317.

Datek Print Quality Seminar. Boston, Oct. 26-28 — Contact: Datek Information Services, P.O. Box 68, Newtonville, Mass. 02160.

Conference of the International Databus Users Group. Dallas, Oct. 27-28 — Contact: International Databus Users Group, Suite 1100, 3232 McKinney, Dallas, Texas 75204.

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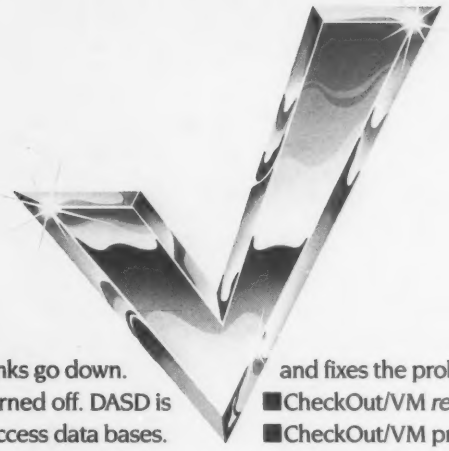

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Khanna

FROM PAGE 111

learned what he calls a guiding principle. "You go where there is tremendous need, where there is a lot to get done," Khanna says. "That's where the greatest challenge is."

At CIT, there is no lack of a challenge. Though its more than $9 billion in assets make it the nation's largest asset-based financial institution, CIT has gone through difficult times since being acquired by Manufacturers Hanover in 1984. A series of poor loans, along with questionable overall management of the company, caused CIT to become a major concern for its parent, which had hoped to gain millions in revenue from the acquisition. By 1987, a restructuring was set in place; one priority was to upgrade and revitalize the company's information systems.

Khanna insists that he did not walk into a hornet's nest. The situation at CIT is nowhere near as bad as published reports painted it, and he has received enthusiastic support from Manufacturers Hanover and CIT in his mission, he says.

To the cutting edge

Khanna's mandate is to turn CIT's information systems delivery into a dynamic and efficient, if not leading-edge, operation that will help CIT's bottom line. "I want to make the technology group at CIT among the best in New Jersey and in the country," Khanna states.

Ed Nyce, the executive vice-president in charge of information technology systems at Manufacturers Hanover, believes that Khanna is the person best suited to handle the turnaround. Nyce, who hired Khanna, was seeking an experienced DP veteran with a good balance between business and technology.

"He faces three significant challenges," Nyce says. "The applications portfolio at CIT is on average the oldest in the entire organization; he has to come up quickly on the learning curve in a new industry, and he is dealing with a very young and inexperienced staff."

Nyce points out that Khanna didn't walk into a chaotic situation. Technology investments at CIT were under way before he joined the company. The systems problems, Nyce says, were also brought into focus before Khanna's arrival. "We were just not getting to where we wanted to be as quickly as we should," Nyce admits. "Some projects were slipping."

If the situation called for a George Patton type, Khanna hardly fit the bill. Quiet, almost professorial in his manner, Khanna is not likely to give fiery speeches to inspire the troops. And Nyce noted this in his decision to bring Khanna aboard. "Kailash is quiet but rock-solid, and the business managers immediately saw a chemistry between them — that he could bring all the key groups together," Nyce says.

Khanna also brought the intangible wisdom accumulated from a lifetime in the business. He points out that an information systems department has three principal constituencies: the company's shareholders and customers; the end users or clients, who are using technology to do their jobs; and the information systems staff.

"It's a continuous balancing," he says. "If you can get good ratings from all three, than you are doing a good job. But you can't sacrifice any of the three."

Khanna is quite clear on his goal. "The bottom line is: What does technology bring to the business? What enhancement do you bring to the shareholders' value?" he states.

After less than five months on board, Khanna has already had an impact, says Al Gamper, chairman and chief executive officer of CIT. In the company's factoring business, which is labor-intensive, Gamper says that Khanna has demonstrated ways to reduce head count and have systems pick up the slack.

"Kailash has already shown us how to streamline the process to continue servicing the client," Gamper says.

The division's numbers already appear to be far ahead of last year's — a projected $120 million in earnings, after Manufacturers Hanover lost an estimated $20 million on CIT in

1987. As CIT moves into stable profitability, it will take pressure off the entire management team, including Khanna. But he says that his biggest challenge is to upgrade the use of technology throughout the division — both in the field and in the home office.

Khanna also notes that part of his challenge is a cultural one. The systems personnel have never been user-oriented. Though capable, their focus has been on centralized DP. "They haven't had a customer mindset," he says.

Khanna claims that there has been no resistance to his changes and little turnover in his staff of 170. "In fact, there is a great sense of excitement, of wanting to do it," he adds.

Despite leaving the leading-edge atmosphere of American Express, Khanna is unapologetic about the level of technology at CIT. In Khanna's opinion, the monetary investment in technology is, on its own, not the criterion by which to judge value. "Spending is a misleading guide," he insists. "American Express got a lot of good press for using leading-edge technology, but the real question is, What value are you getting out of it for the business? There were pockets there where you didn't get the value."

Khanna likes to measure his task not by how far behind he lags, but by how long it will take to get a top-quality technology exploitation plan functioning. For that he estimates a two-year timetable.

And he is in no hurry. As he felt when he joined TWA, American Airlines and American Express, Khanna is in for the duration. He fully expects CIT to be his last stop, although that could easily change if the challenge disappears.

Aside from trips to visit his extensive family in India, Khanna tries to find enough time for his passion — tennis, which he and his wife, Lee, play regularly. Their 18-year-old daughter just made the move to campus life at her father's alma mater, Columbia, and their 14-year-old son is entering high school in Montclair, N.J., which is the hometown of the Khanna family.

Khanna, who turned 50 in September, says he feels fortunate that his career has focused more on the innovative and changing nature of technology development than on the day-to-day running of DP. With a Ph.D. in operations research, he says he would rather be a constant driver of change than a status-quo preserver. "In this industry, that's been a fantastic place to be for the past 10 years," he says.

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LOCAL HAPPENINGS

NORTHEAST

Boston, Oct. 12. Data Administration Management Association's Data Modeling Showcase. John Hancock Conference Center. Contact: Michael West, 617-570-4434.

Cherry Hill, N.J., Oct. 12-14. East Central NCR Users Organization, Eastern America Users Conference. Cherry Hill Inn. Contact: Frank Whalon, 215-675-7104.

Hempstead, N.Y., Oct. 18. Association for the Advancement of Communications Technology (AACT) general meeting. Hofstra University Club. Contact: Mike Lackey, AACT president, 516-269-6713.

Waltham, Mass., Oct. 18. Independent Computer Consultants Association, Greater Boston Chapter. Quality Inn. Contact: Abe Manevitz, 508-887-1826.

Waltham, Mass., Oct. 18. New England EDP Auditors Association. Cottage Crest. Contact: Linda D'Agostino, 617-727-6200.

Boston, Oct. 26. Boston Computer Society general meeting, "Future of Operating Systems." Hynes Convention Center. Contact: Boston Computer Society, 1 Center Plaza, Boston, Mass. 02108.

MID-ATLANTIC

Essington, Pa., Oct. 21. Delaware Valley DB2-SQL/DS Users Group, "A Practical Approach to Database Design." Ramada Inn. Contact: Delaware Valley DB2-SQL/DS Users Group. P.O. Box 7777-W2470, Philadelphia, Pa. 19175.

MIDWEST

Fort Wayne, Ind., Oct. 18. Fort Wayne Chapter of the Association for Systems Management, "Managing for Success and Career." Holiday Inn Downtown. Contact: Mike Fritsch, 219-432-3975.

WEST

San Francisco, Oct. 21. San Francisco Bay Area Revelation Users Group's Revfaire '88. Hyatt Regency, Embarcadero Center. Contact: Margaret Steyer, 415-986-1717.

MANAGEMENT BRIEFS

Virginia council to study info tech

Virginia Gov. Gerald L. Baliles recently appointed six members to the new **Council on Information Management**, which intends to develop a four-year state plan for the acquisition, management and use of information technology at state agencies and institutions.

The council members are J. T. Westermeier, computer law-group head at Abrams, Westermeier & Goldberg, P.C. in Washington, D.C.; Robert O. Harris, information systems director at the U.S. House of Representatives; James T. Matzey, director of automation development and operations at Reynolds Metals Co.; Doris J. Spencer, Office of Information Resources Management director at the U.S. Maritime Administration; L. E. Kittleberger, director of corporate computer services at Newport News Shipbuilding; and Vanessa O. Myers, manager of telecommunications at Best Products Co.

The governor also appointed William E. Lansidle to serve as staff director of the council. Lansidle previously served as deputy commissioner for administrative services at the Virginia Department of Motor Vehicles.

The **Data Processing Management Association** (DPMA) Distinguished Information Sciences Award will be presented to Retired U.S. Army Lt. Gen. Emmett Paige Jr. at the DPMA computer conference later this month.

Paige, 57, former chief of the Army Information Systems Command, will be honored for his work in bringing automation to the Army during a 40-year military career. He retired earlier this year.

The DPMA conference will take place in Dallas from Oct. 31-Nov. 2.

The 121 alumni who earned master's degrees in computer and information systems at **Dartmouth College** can consider themselves members of an elite club. The MIS-oriented program has been discontinued.

The 9-year-old master's program died a quiet death when the last students graduated a few months ago. The program was a victim of revenue shortfall, since it never attracted enough students to become self-sufficient, and its administrative approvals for grant solicitations tended to occur at times when corporations had committed their funds, according to a college spokeswoman.

The **National Automated Clearing House Association** (NACHA) is joining the **American Bankers Association** (ABA) task force working on point-of-sale (POS) issues. NACHA, an electronic payments network, says it will work with the ABA so that automated clearinghouse service options will be included in the ABA's POS guidelines. NACHA named four representatives to the task force.

The founding director of the American Bar Association's Legal Technology Advisory Council has announced a new venture known as the **Law Office Automation Center**. Richard L. Robbins, a lawyer and electrical engineer, said the Chicago-based center will develop programs including consulting, research, training, seminars, newsletters and books and will work in partnerships with business, research and educational enterprises.

The **International Conference on Information Systems** is soliciting papers for its Dec. 4-6, 1989, event in Boston. The conference is sponsored by the Society for Information Management, the Institute of Management Sciences and the Association for Computing Machinery.

Information on the papers program is available from Benn R. Konsynski, Harvard Business School, Loeb 23, Soldiers Field Road, Boston, Mass. 02163.

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The Program

Day 1 — Monday

Introduction - Thomas Swithenbank, President & COO, IDC; Fritz Landmann, President, Computerworld; Steven Woit, Publisher, Federal Computer Week

Keynote Address - Dr. Walter Culver, Corporate VP, Computer Sciences Corp.

Leading Edge Technologies - Ken McPherson, Director/ Software Vendor Research, IDC; Ellen Staelin, Manager/ Technology Futures Service, IDC

Corporate Networks - Mark Leary, Director/Communications Research, IDC

CIM - Scott Brady, Senior Consulting Manager, Arthur Andersen & Company

ADAPSO - George T. DeBakey, Executive Director, ADAPSO; Robert Laurence, President, Oracle Complex Systems Corp, Inc.

Government Trends - Dr. Thomas R. Davies, General Manager, Systems and Computer Technology

Contractual Issues - Theodore Ryan, President, Business Development Division, Electronic Data Systems

IBM Perspective - Gerald Ebker, VP & President, Systems Integration Division, IBM

Public & Private Sector User Panel

Day 2 — Tuesday

Concurrent Case Study Presentations:

Federal Government Panel - Peter Bracken, VP Federal Systems Integration, Martin Marietta Data Systems; M. Dendy Young, Chairman, Falcon Systems

Commercial Panel - Robert Henderson, Marketing Director, NCR Corp.; Ann Lazerus, Marketing Director, McDonnell Douglas; Judy Hamilton, Partner, Arthur Young & Co.

Investor's View - Stephen McClellan, VP Securities Research & Economics, Merrill Lynch

Human Resources Issues - Peter Sandiford, President & COO, SHL Systemhouse

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". . .Computerworld Response Cards reach our market. I know this because we got 260 cards back right away."

Carlos Cadalzo is president of Integrated Systems Technology, Inc., a 10-year old CICS consulting company that recently began marketing PC-based development tools for on-line systems.

The company created the Quick Screen 3270, a development tool that helps analysts design screens for CICS and IMS/DC systems — without requiring a programming background. The next step was to determine the best way to reach the buying market for this new tool. And for Carlos, the first option that came to mind was *Computerworld.*

"I wasn't sure exactly how to do it, but I knew that Computerworld *reaches the people we want to talk to. So when I met with a* Computerworld *sales representative and described the situation, he suggested* Computerworld *Response Card decks.*

"The result was great news all around. I learned there is definitely a market for the Quick Screen 3270 — and that Computerworld *Response Cards reach that market. I know this because we got 260 cards back right away. And four weeks later they were still coming in, which is also very impressive.*

"At first we were concerned that we didn't have the resources to do a full market study, but the cards told us everything we needed to know. We got both quantity and quality in terms of responses. At least 20 cards came back from Fortune 500 companies alone.

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— Carlos Cadalzo
President
Integrated Systems Technology, Inc.

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COMPUTER INDUSTRY

INDUSTRY INSIGHT

William Zachmann

MIS: Don't ignore Unix

Unix provides what may be the most striking set of contrasts concerning computer systems in the 1990s.

On the one hand, there are many authoritative sources claiming that Unix will emerge as the dominant standard operating system in the decade ahead. At the same time, surveys of data processing professionals in the real world continue to show Unix to be little more than an idle curiosity with a truly insignificant share of mind — to say nothing of market share — in corporate America.

The spectacular divergence of views over Unix is merely one example of the wide diversity of opinion over where the industry is going in the years ahead.

Questions

What impact is Unix likely to have on corporate computing? Is it just another fascinating topic to give the trade press something to write about and consultants something to consult about? Is the whole Unix phenomenon just another example of the fact that fads are as capable of sweeping the computer industry as they are in other aspects of human life?

Continued on page 129

Braced for a tough quarter

Look for disappointing results from Apollo, CDC, Tandem, DG, Lotus

BY NELL MARGOLIS
CW STAFF

"May you live in interesting times."
Ancient Chinese curse

Disappointing numbers, diminishing opportunities and winds of a possible price war were the recurrent themes struck last week as analysts lined up to forecast an underwhelming third quarter for the computer industry.

"This is going to be a tough quarter for everybody," said Dale Kutnick, an industry analyst in Redding, Conn. Customers' fiscal conservatism and a plethora of product and strategy announcements, he said, combined in the summer months to slow growth across the board.

"People have been looking for any excuse not to buy," noted Stephen Dube, an analyst at Shearson Lehman Hutton & Co., "and the industry has been giving it to them."

Buoyed by a generally robust spring quarter, companies "ramped up for a much stronger market than we actually saw; companies front-ended projects that they now can't back out of," said Smith, Barney & Co. analyst Shao Wang. Big-ticket commitments in a slow market, he said, are a major factor in the generally flat or reduced sales and earnings figures that the industry can expect to be deluged with.

Subexpectation earnings, in fact, have already been warned of by the likes of Apollo Computer, Inc., Control Data Corp. (which expects a quarterly loss), Tandem Computers, Inc., Data General Corp., Lotus Development Corp. and Seagate Technology (which will report a substantial quarterly loss) — to name just a few.

Both IBM and Digital Equipment Corp., Wang said, should log earnings increases — but nothing spectacular. "If I'm wrong," he added, "I bet I'm erring on the high side."

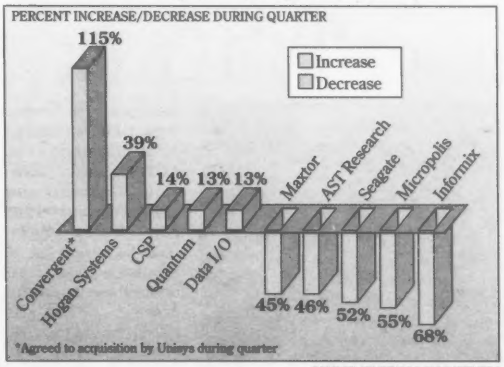
Computer companies in the mature, highly competitive midrange sector are expected to take the hardest hit. "The midrange is going to be a disaster," Kutnick said. "DEC is still lead-

Continued on page 126

Data View

Disks drive their makers down

Five best and worst performing computer stocks, third quarter



SOURCE: TECHNOLOGIC PARTNERS
CW CHART

Paradyne's woes not over

BY ELISABETH HORWITT
CW STAFF

LARGO, Fla. — Paradyne Corp. has just paid a whopping $26 million in order to disentangle itself from a seven-year litigation and jettison aging and unprofitable product lines.

The money is well spent, according to Paradyne President and Chief Executive Officer John Mitcham, since it frees the troubled networking company to concentrate on profitable offerings. But Mitcham's hopeful picture was belied last week when

Continued on page 127

Perot roars back, sues EDS/GM

BY NELL MARGOLIS
CW STAFF

DALLAS — Anyone who wondered how H. Ross Perot would follow up the fighting words he fired at his old company and its owners last month didn't have to waste any time waiting for Perot.

The flamboyant Texan entrepreneur, who once staged his own paramilitary mission to rescue employees who had been taken hostage in Iran, again demonstrated his penchant for quick and decisive action.

Last week, he filed a countersuit to the legal action brought against him [CW, Oct. 3] by Electronic Data Systems Corp. and General Motors Corp., which bought EDS from Perot in 1986 for $700 million.

Strong words

Perot claimed that the EDS/GM action, filed in Virginia and scheduled for hearing this week, "continues a clear pattern by General Motors, the world's largest company, to crush a tiny company that GM gave the right to be formed in a clearly worded agreement." Perot issued a statement that "GM will not succeed. It has made a serious strategic mistake."

Perot's complaint, filed in Texas state court here, formally charged EDS and GM with plotting and carrying out the demise of his new firm, Perot Systems Corp. As do EDS and GM in their suit, Perot seeks an injunction — in this case to halt what he claims is an EDS/GM attempt to keep Perot Systems from competing in the systems integration market on a nonprofit basis.

An EDS spokeswoman said the company has no comment with respect to the latest turn of events in the escalating marketplace and courtroom drama, other than to note that Perot "cites the very same issues that we do. We wonder why he is unwilling to let them be decided by a Virginia court."

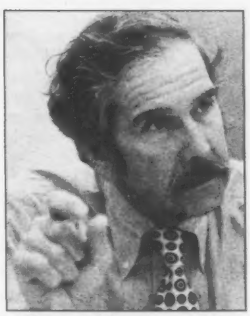
SIA foresees decline in chip demand by '90

BY J. A. SAVAGE
CW STAFF

SANTA CLARA, Calif. — There have been downturns in the semiconductor industry before, but the Semiconductor Industry Association (SIA) has never before predicted one. Breaking with the past, the SIA predicted, at its annual meeting late last month, that there will be a 3% decline in the worldwide semiconductor market in 1990.

The slowdown will be fueled by increasing manufacturing capacity and a decline in sales of low-end computers, according to Alfred Stein, chief executive officer of VLSI Technology, Inc.

Diminishing low-end sales will not affect the industry so much in 1989. Next year, the SIA anticipates 10% growth worldwide. That is down, however, from a 38% increase this year.



National Semi's Sporck

The numbers belie strong growth in the CMOS market, according to Adam Cuhney, an analyst at Kidder Peabody & Co. in San Francisco. Cuhney said the market for CMOS logic chips is expected to be up 23% and CMOS memory up 50% next year.

"Those that are providing proprietary CMOS and gate-array chips will do remarkably well," he said.

Japanese control of the dynamic random-access memory (DRAM) chips market is expected to continue, but the shortage is expected to ease. "I believe the shortage will be over next year, especially given somewhat of a slowdown in the market," said Charles Sporck, president of National Semiconductor Corp.

Sporck discounted attempts by American manufacturers to gain control of the DRAM market. "I can't imagine a normal venture capital approach" to a new DRAM business, he added, estimating that such a venture would cost $250 million and be several years too late.

The very day the SIA made its forecast, chip giant Advanced Micro Devices, Inc. said its poor third-quarter earnings will cause it to lay off 1,400 Asian workers.

Cuhney called AMD's situation "extremely perilous," because it does not have Intel Corp. 80386 manufacturing rights and the "80286 business will rapidly dissolve."

Inside

- Daisy Systems tries hostile takeover of CAD firm. Page 126.
- Much head-scratching over Alpha Microsystems' Doelz buyout. Page 127.

Leasing

FROM PAGE 1

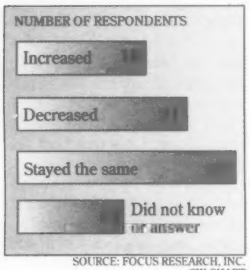
lessors' point of view, and they'll find that out in the next few years. But until then, we're enjoying the marketplace."

Dean is not alone. In a recent *Computerworld* survey of leasing by large U.S. mainframe sites, 62% of respondents who lease computers and/or peripherals said their rates have decreased or remained about the same since the Tax Reform Act of 1986. Although rates always vary widely among lessors and products, users say rates have dropped 20% to 30% in some cases.

That trend has sent major shock waves through an industry that has historically enjoyed hefty profit margins, sports cars and Rolex watches. "The days of easy profits are long gone," says Philip Hold, president of Atlantic Computer Systems, Inc., the U.S. subsidiary of the UK's Atlantic Computers PLC.

What tax change?

The Tax Reform Act of 1986, despite dire predictions from the leasing industry, has apparently not resulted in overall higher lease rates, based on 77 respondents



SOURCE: FOCUS RESEARCH, INC.
CW CHART

Surprise, surprise

What has caused this unexpected shift to benefit the users? Independent lessors almost unanimously point the finger at IBM Credit Corp., which they contend is aggressively buying market share with hard-to-match deals for customers.

"I am convinced that IBM Credit is the culprit," says Kenneth A. Bouldin, president of the Computer Dealers and Lessors Association (CDLA), the Washington, D.C.-based trade group that represents third-party leasing firms. "Our members have no choice but to meet or beat IBM Credit. A guy not willing to chase those deals gets no market share at all."

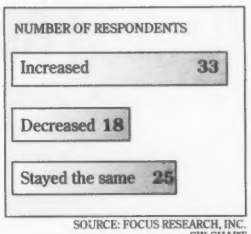
The key to quoting lower rates for the users is a lessor's residual value assumption — the projected value of the CPU or peripheral when its lease ends and the lessor resells it in the secondary market. The lessor's profit comes from the user's finance payment and the future resale value of the machine, so a high residual assumption means a lower lease rate. "[Leasing] is very much a residual game now," Pepsico's Dean says.

Some customers say they have leveraged that situation by carefully choosing which products to lease rather than buy.

"There is certain equipment — 3480 tape drives and 3990 controllers, for example — that I think will have a good life and that I'm willing to purchase," says Bill Fleischman, an assistant vice-president involved with computer leasing at Baltimore's Equitable Bank NA. "But on other products I shop heavily for [lease] rates. I'd rather let some speculating leasing company take the gamble on it."

Thriving on adversity

Lessors may be feeling the pinch, but among 76 lessees, demand has been higher during the past three years



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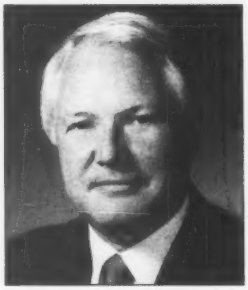


> "EVERYONE appears to be for sale. We literally get two to three proposals a week [from prospective acquisitions]."
>
> PHILIP HOLD
> ATLANTIC COMPUTER

Independent lessors charge that IBM Credit has become the industry's leading speculator, taking residual positions that result in what Bouldin calls "kamikaze rates."

CDLA members say IBM Credit has also taken on third-party competitors in other ways, such as seeking the upgrade business on 3090s that IBM Credit did not lease originally and giving incentives to IBM salesmen to steer leasing business to IBM Credit when they cannot convince the customer to buy.

IBM Credit insists that its leasing strategy has not changed. "We have not changed the way we do business," said a spokesman for Stamford, Conn.-based IBM Credit.

Policy shift?

Third-party lessors say, however, IBM Credit's recent aggressiveness represents a major IBM policy change that threatens the delicate, symbiotic IBM-CDLA relationship (see story below). But a former IBM Credit executive says the firm has also become a better leasing company.

"It's a maturing process, not a strategy change," says Darrell Balmer, IBM Credit's former manager of government financing, who joined the Gartner Group, Inc.'s financial strategies

CDLA's Bouldin zooms in on IBM Credit

IN PERSON

When former Econocom-USA Chairman Kenneth A. Bouldin agreed to succeed the late James K. Benton as Computer Dealers and Lessors Association (CDLA) president last spring, he walked into a brewing firestorm. Unprecedented competition among computer lessors had cut profit margins to the bone, with many CDLA members turning into acquirees just to stay in business.

But Bouldin has identified a common enemy for CDLA firms in IBM Credit Corp. In a hard-hitting interview with *Computerworld* Senior Editor Clinton Wilder, Bouldin charged that IBM Credit's recent aggressiveness threatens the delicate truce of the last few years between IBM and its single largest market — the third-party equipment dealers and lessors.

What is causing the lower computer leasing rates that lessees have been seeing since tax reform?

I am convinced that it can be all tied to a single source. The culprit is IBM Credit Corp. They are taking an aggressive position [on rates] that is absolutely not required. They are leaving so much money on the table that the only one benefitting is the lessee.

It takes no genius to see that they're taking risks that are unreasonable. I can't say that IBM Credit is the only stupid one in the business; I've got a whole bunch of guys out here who have followed them right down the tube and are quoting the kamikaze rates themselves, saying, "IBM Credit must know something we don't know."

If that keeps up, what will be the long-term impact on the leasing industry?

There's a real problem brewing, not only for our industry, but I'm convinced it's a great problem for IBM. There will be a day of reckoning. In terms of their future performance, the aggressive position they're taking will come back to bite them. The laws of business will cause them to recognize that their current strategy is not the right one. Then they will return to high rates, and everybody else will return to the high rates also.

In the meantime, it's sad to report that there will be quite a bit of fallout and continued consolidation among our members. They will be forced to go out of business or to consolidate with someone who does have the staying power.

What will the CDLA try to do about IBM Credit?

We need to deliver a message to the key players, the Management Committee of IBM. We have started that process and will intensify the effort, with both people and dollars.

> "WE NEED TO deliver a message to the key players, the Management Committee of IBM."
>
> KENNETH A. BOULDIN

You will see us also beef up our efforts with other manufacturers, where we now see acceptable risk in residuals and being able to finance equipment. DEC and the telecommunications field are our main priorities.

It has always been a tricky business to manage the relationship between the CDLA and IBM. How would you characterize that relationship now?

IBM did a super job of creating a communications vehicle in their Industry Relations Group. In the past, we have found that to be very effective. That group of people understands our business.

IBM's senior management agrees philosophically that they want the secondary market to continue to survive and be healthy. They tell you all the right words in the meeting. But IBM has created a situation where the message is not really striking home.

In what ways?

For example, IBM came out last fall with new maintenance and parts availability policies [CW, Nov. 9, 1987]. They announced that to us [at last fall's CDLA meeting] in Bermuda and we said, "Whoa." We started pleading our case and got the maintenance policy changed and the parts policy deferred.

But the way we ended up solving it was forming an ad hoc committee that filed a complaint with [the Department of] Justice. The minute that was filed, everyone comes to the table.

It's been a friendly relationship in the past, and there's still a camaraderie and good relationship between our association and IBM at the Industry Relations level. At policy level, though, it took an adversarial position to get their attention.

So are you heading toward a more contentious relationship with IBM?

We've had a good thing going now for about 20 years. It's been a great marriage, but now it's getting on the rocks a little bit between us. I'm convinced that two years from now, it will come back strong. But in a marriage, what can happen is that a couple gets on the rocks, they get divorced, and two years later they both wish they'd stayed married. But it's too late.

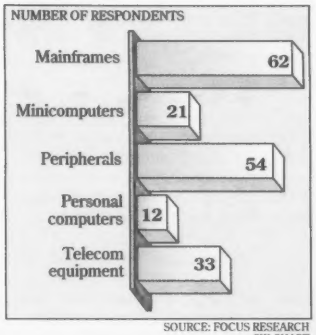
In the meantime, there are some companies that are pretty damn smart, and one of them is DEC. DEC has started talking to us where they haven't before.

How can you convince the lessees — particularly now, while they're enjoying the low lease rates — that there are signs of long-term trouble ahead with IBM?

Someone, perhaps someone like Guide, has got to talk to the end users. We really haven't taken

Paying for that big CPU

Mainframes continue to present the most attractive lease option among 77 sites that lease equipment



SOURCE: FOCUS RESEARCH
CW CHART

service earlier this year. "They have learned more about how the industry operates and what you have to do to be effective."

Competing with IBM Credit has made access to large amounts of capital a virtual necessity for independent lessors, and that has ignited the torrid pace of consolidation. Small and medium-size leasing firms are being bought every week by larger lessors or financial services firms not previously involved with computers.

"Everyone appears to be for sale," says Atlantic Computer's Hold. "We literally get two to three proposals a week [from prospective acquisitions]."

the time to tell them that they have a vested interest in what we're working on. Without us as a threat, IBM will charge what they want to charge.

We wouldn't deny that we're working on our own interests first, but we should convince them it's a common interest.

It's a hard point to sell right now while they're getting the best of both worlds. They're getting low rates. and we're still around to trade equipment. It's hard to convince someone until he gets in trouble that there are some signals he better pay attention to.

When things get as competitive as they are now, does it send up a red flag that some leasing companies, out of desperation, may resort to unethical business tactics?

I hope not. But we don't plan to change our standards or relax on enforcing them, even if it means there are only two guys left in this association.

Do you think the CDLA has made strides in erasing the memories of the Itel and OPM scandals?

Yes, I really do. Those had the effect of changing the way we do business in certain cases. The people who are good are still in the business. Itel survived, even though they're not in our business anymore. The OPM disaster improved our business practices.

I think, as a result of the hard times we're in right now, that we're going to come out with better-run companies. It's one thing to run a company in good times. You can always sell yourself out of a situation. Today you need expense control, good management, solid financing. The light at the end of the tunnel is that those who remain will be stronger.

THIRD-PARTY lessors say IBM Credit's recent aggressiveness represents a major IBM policy change that threatens the delicate, symbiotic IBM-CDLA relationship.

But the industry is so competitive that size is no guarantee of success. The second-largest independent lessor, Continental Information Systems Corp. (CIS), shocked the industry last year by prevailing in a court fight to acquire its next-largest competitor, CMI Corp. But the result has been less than enviable: CIS reported an unexpected $7.5 million quarterly loss earlier this year.

Another factor keeping rates down is that users have become more savvy about the business — shopping around for the best deal and asking hard questions about the lessor's financing.

The *Computerworld* survey, conducted by Focus Research, Inc., found that one-third of customers at large mainframe sites have changed lessors in the past three years, and 73% of them switched from one third-party lessor to another. "We found a lot of price sensitivity and no real vendor loyalty," said Focus Research analyst Jeff Lee.

Although rate is still the prevailing factor for choosing a lessor or deciding whether to lease at all, lessors are demanding more than that. "I can say [to a lessor] that you're insulting my intelligence with that rate," Equitable's Fleischman says.

Lessors agree. "If we just did low bids, we wouldn't have any long-term relationships," says Richard Kazan, president of Colorado Springs-based Capital Associates, Inc., the U.S.' third-largest independent lessor behind Comdisco, Inc. and CIS. "We're seeing a very sophisticated user at the decision-making level."

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Daisy eyes Cadnetix takeover

BY JULIE PITTA
CW STAFF

MOUNTAIN VIEW, Calif. — Daisy Systems Corp. has launched a hostile takeover bid for Cadnetix Corp., a Boulder, Colo., manufacturer of computer-aided design (CAD) systems.

Daisy already holds 1.03 million shares of Cadnetix stock, or a 7.6% stake in the company. It is looking to gain 51% of the company through a tender offer of $8 per share.

The number of shares Daisy must purchase depends on whether Cadnetix completes a proposed merger with another firm and acquires a third company before Daisy completes its purchase. Recently, Cadnetix announced its intention to merge with HHB Systems, Inc. and acquire Simeaud, Inc.

If the transactions are consummated, Daisy must purchase 11.73 million shares of Cadnetix stock to gain control of the firm. If not, Daisy will need to purchase only 7.24 million shares of Cadnetix to gain a 51% stake.

A Daisy spokesman said the action came out of Cadnetix' refusal to enter into negotiations. Daisy officials contacted Cadnetix management in May and June and again two weeks ago.

Cadnetix officials declined to return phone calls last week.

No interest

"All we've done is call Cadnetix management and ask them about a merger," the Daisy spokesman said. "They have so far declined to discuss it with us. The response has continued to be, 'We're not interested.' "

Daisy refused to drop merger plans because "the marriage between the two companies is too attractive," the spokesman said. "It's easy to find acquisitions that are less hostile but not as attractive."

Cadnetix has said it will respond to the Daisy tender offer by Oct. 14. Daisy officials said they are confident that the takeover will become friendly, according to the Daisy spokesman.

Cadnetix markets turnkey CAD systems for printed-circuit board layouts. These are expected to mesh well with Daisy's system-simulation products, the spokesman said.

Braced

FROM PAGE 123

ing the pack, but even DEC is going to have problems."

Much of the big chill, he said, can be attributed to the big squeeze: increasingly powerful microcomputers at the low end and PC local-area networks at the high end.

"What used to be a three-tier structure at many [user sites] — mainframes, minis and PCs — is now a 2½-tier structure: PCs, servers and mainframes," Kutnick said.

Unix is the word

However, Kutnick said, the main word striking confusion into the heart of the mid-range market is Unix. "Unix is growing at about 40% this year," he said, "and that's coming out of somebody's hide. And the birth of the OSF earlier in the quarter has people thinking about Unix even more than before."

In addition, Kutnick said, "the IBM AS/400 is starting to ship. It's not the greatest thing since sliced bread, but it is a very attractive box."

"There are stronger areas and weaker ones in the technology market this quarter," said Martin Ressinger, an analyst at Duff & Phelps, Inc., "but most of the stronger areas are weaker than they used to be. I don't know of anything that's really flying." The microcomputer sector, while wreaking some amount of havoc for the mini sector, is not itself booming.

Mixed bag

"PC hardware is a mixed bag this quarter," said Peter Rogers, an analyst at Montgomery Securities in San Francisco.

"Companies with the right products — 386-based products, which is what everyone wants — and the right distribution are doing well. Apple and Compaq, for instance, are both actually ahead of plan."

On the other hand, he said, AST Research, Inc. and Wyse Technology, Inc., both of which are shipping Intel Corp. 80286-based boxes, are behind — and both have warned investors to expect fallen earnings.

While the bag might be mixed, Kutnick said, the signals are clear: "I see a price war coming in the PC market." And the winner? "The user. People will try to unload boxes at any price."

"The [PC] software side is a mixed bag, too, but for different reasons," Montgomery Securities' Rogers said. Delayed introductions of vaunted new product lines, he noted, presented Lotus and Ashton-Tate with credibility hurdles. "Late introduction of new releases is a problem; when 60% or more of your sales come from that product line, it's a *big* problem."

Give me shelter

Mainframes, said Duff & Phelps' Ressinger, "are a little better shielded from the PC and workstation rush that seems to be disrupting the mini sector —and disrupting itself."

However, he said, with the European market looming increasingly large on the balance sheets of many mainframe companies, a slowed rate of economic growth in Europe and decreasingly favorable currency comparisons, as well as a greater sensitivity to the traditional European August vacation slowdown, dampened the third-quarter outlook in the mainframe sector.

Looking ahead, analysts voiced cautious optimism with regard to a fourth-quarter upturn. "Companies have been underspending, and by year's end, some decisions will have to be made," Shearson's Dube said. "Hopefully, some of this year-end budget cleaning will benefit the computer industry."

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Alpha and Doelz: Odd couple?

BY KATHY CHIN LEONG
CW STAFF

SANTA ANA, Calif. — Alpha Microsystems, Inc.'s attempt to take over Doelz Networks, Inc. has industry analysts shaking their heads.

Alpha Microsystems, which has weathered its share of financial storms because of competition from the low-end personal computer market, has somehow acquired the option to purchase the operating assets and liabilities of Doelz, a privately held Irvine, Calif.-based networking company [CW, Oct. 3].

Brad Baldwin, an analyst at Dataquest, Inc. in San Jose, Calif., said, "There doesn't seem to be a lot to be very positive about this. If it went through, it could limit Doelz's penetration into other host markets."

John Cain, president of Alpha, would not disclose how the company attained the option to buy or how much it is offering. Cain refused to discuss the reasons for the desired acquisition and said the companies have had no relationships in the past.

Doelz, in the meantime, has declined to comment on Alpha Microsystems' latest moves. Financially strapped Doelz sells a variety of digital networking equipment typically used by banks and universities.

Doelz, which now has a head count of 100, has already been through one layoff of some 50 employees and has been embroiled in a lawsuit accusing AT&T of encouraging Bank of America to break a $20 million contract with Doelz.

'A good choice'

In a prepared release, Alpha Microsystems said Doelz was a good takeover choice because of the company's solid manufacturing capabilities and professional technical expertise.

But spectators of merger mania find the match an odd one. Rick Villars, an analyst at International Data Corp., was lukewarm about the impending deal. "Doelz has been on the block for a month at least. They do offer an excellent alternative for companies that are migrating from analog to digital data networks," he said.

In September 1986, Televideo Systems, Inc. had its heart set on buying Alpha Microsystems for $25.6 million. It never went through because of a management shakeup at Televideo.

Paradyne

FROM PAGE 123

Paradyne reported a third-quarter loss and revealed that it is now in technical default on some agreements with its creditors.

"The events speak for themselves," said Andrew Schopick, a senior analyst at Gartner Group, Inc. subsidiary Soundview Financial Group (formerly Gartner Securities). Last week's actions were "another clear indication that Paradyne is still in financial difficulties, with little prospect of a turnaround in its performance," he added.

Paradyne paid $6 million to settle out of court a suit filed by Sigma Data Computing Corp., now a subsidiary of M/A-Com, Inc. Sigma sued Paradyne for loss of profit in 1981, contending that the networking company had unfairly won a major Social Security Administration contract that would otherwise have gone to Sigma.

The remainder of the $26 million, which Paradyne reported as a charge for the third quarter, is the result of severance payments, operational consolidation and the need to write off inventory for "older product groups [that use] older technologies and for which there is no longer a market," spokeswoman Martha Good said.

As of Nov. 1, products that Paradyne will continue to support but no longer sell include packet switches, data encryption, terminal products and certain peripherals.

Severance was paid to some 300 employees, or about 10% of Paradyne's work force, who were laid off in July.

The company has no immediate plans for additional layoffs, Mitcham said. Employees who had been associated with the discontinued product lines will be reassigned to other areas, he added.

As a result of the $26 million outlay, Paradyne violated a covenant with some of its lending institutions, which required the company's net worth not to fall below a certain level, Good said.

Paradyne was not able to renegotiate its agreements with creditors by quarter's end, and, consequently, it had to report the default.

'Paid its debt'

"Paradyne has met its debt payments and will continue to do so," Mitcham emphasized.

The company is now free to focus its development and marketing efforts on "areas where we are strong," including channel extension offerings, modems, T1 switches, multiplexers and other digital products as well as service offerings, Mitcham said.

However, Paradyne may be revamping its product strategy years too late, according to Schopick. The company has thus far failed to develop important new products and to make a timely transition from analog-based modems and network management to up-and-coming digital-based products, Schopick added.

"The channel-based networks are the only area of business that has any continuing growth in demand, and that has a number of established competitors," Schopick said.

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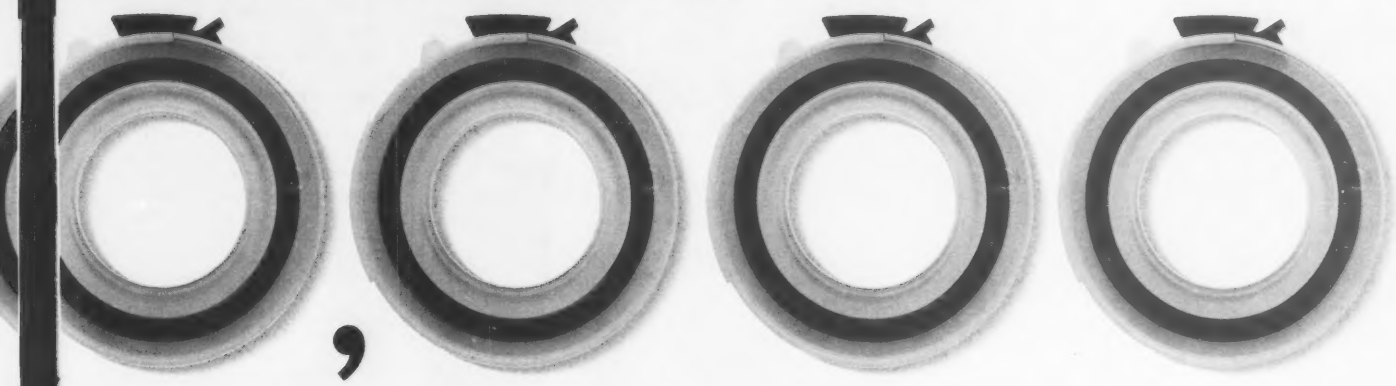

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Sweeping changes at Siemens AG under way

BY AMIEL KORNEL
IDG NEWS SERVICE

MUNICH, West Germany — Siemens AG, West Germany's largest industrial group, said last week it had launched the first stage of a far-reaching reorganization in an effort to gain greater efficiency. The company announced plans in July to restructure over a two-year period in a drive to improve its international competitiveness.

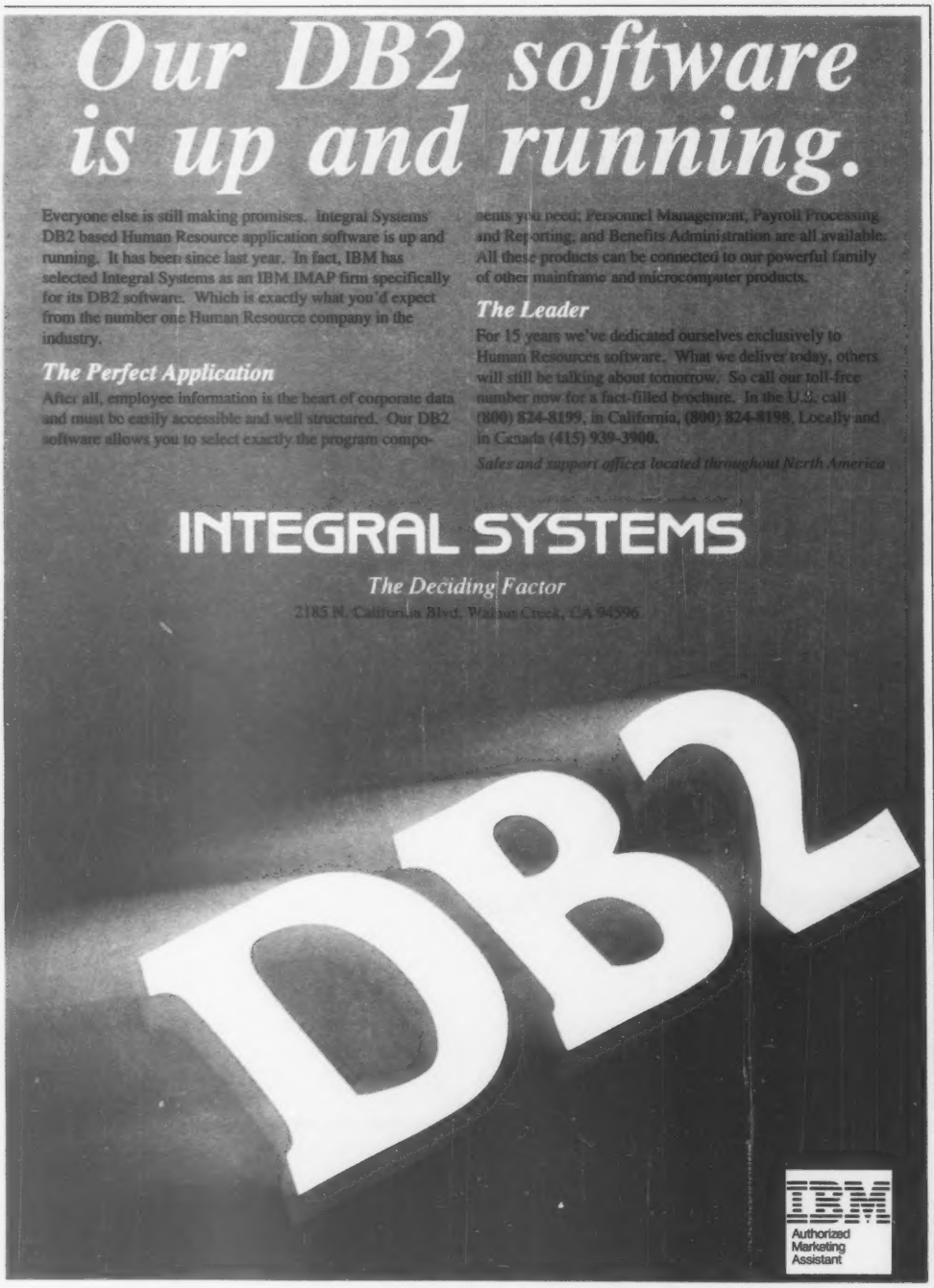
As the company outlined, new divisions created at its headquarters here are company planning, finance, research and development, production and logistics and personnel. More than 9,000 employees at the firm's headquarters will be affected by a massive reshuffling designed to create smaller units with increased efficiency, according to a statement released by Siemens.

In April, the company began restructuring its information technology activities when it started transforming four divisions into two private communications systems units.

Divisions responsible for communications terminals and peripherals are being merged into an equipment division. Telecommunications networks and security systems represented 18%, or about $6.08 billion, of total sales of $30.7 billion last year. Communications and information systems represented 19%, or about $6.14 billion.

In August, Siemens reported that net profit rose 2% to $577 million for the nine-month period ending June 30. Revenue rose 6.7% to $23.7 billion during the same period, the company said. Foreign sales accounted for 50.1% of total group revenue. The company has said that it expects foreign sales to account for 60% of total group revenue by 1990.

Siemens is West Germany's largest supplier of electronics, computers and telecommunications equipment.



IN BRIEF

Micron money infusion

Boise, Idaho-based semiconductor maker **Micron Technology, Inc.** got a pat on the back and a boost in the bank account last week when $1.5 billion British consumer electronics and microcomputing products vendor **Amstrad PLC** bought $75 million worth of Micron stock, which totals 9.8% of the firm. Alan Sugar, chairman of Amstrad, will become a Micron director upon the closing of the deal, pending U.S. government approval.

Whir of activity at Gould

Comings and goings at **Gould, Inc.**: James McDonald last week resigned as chairman and chief executive officer of Gould to become a board member of **Gould Navcom Systems, Inc.**, a new company subsidiary that will be part of a voting trust, which will hold what remains of the company's defense operations after the recent acquisition by **Nippon Mining Company Ltd.** Replacing McDonald is Gould Vice-President of Materials and Components C. David Ferguson. In related news, Gould also announced the imminent relocation of its worldwide headquarters from Rolling Meadows, Ill., to Eastlake, Ohio, home of its Foil Division — one of the few units not subsumed under the Nippon buyout. About 50 jobs will be eliminated in the move.

Miniscribe chops 350 workers

Disk drive manufacturer **Miniscribe Corp.** lopped 350 employees from its rolls last week "to accommodate forecasted shifts in the company's product mix over the next six months," according to a company spokesman. Approximately 85% of the affected workers constituted a temporary work force that had been put together to accomplish "short-term production requirements" at Miniscribe's Longmont, Colo., manufacturing site.

According to Miniscribe Chairman and CEO **Q.T. Wiles**, annual revenues of $688 million and a pretax profit of $69 million projected for 1988 are still on target.

CMS enhancing self with public offering

CMS Enhancements, Inc. is taking its show on the road and its company public. The Tustin, Calif.-based purveyor of memory products to the microcomputer market recently filed a registration statement with the Securities and Exchange Commission for an offering of 1.5 million shares of common stock.

Zachmann

FROM PAGE 123

Or is there really something more important here that information systems professionals need to take into account?

What follows is merely one person's opinion: mine. Hopefully it is a reasonably well informed opinion that will prove to be an accurate signpost to the future for those who read it.

Coming on strong

In the first place, Unix nearly certainly will emerge as the dominant standard in operating systems for systems built on a foundation of one or more microprocessors and designed to function in a manner similar to that of traditional mainframe and minicomputer systems.

Vendors building multiuser systems around one or more Motorola 68000 or Intel 8086 microprocessors or newer reduced instruction set computing-influenced chips are virtually certain to make some form of Unix the foundation of their operating system.

There are three fundamental reasons that Unix provides the operating system of choice for multiuser, microprocessor-based systems. First, it is good enough. Unix provides a more than adequate operating systems foundation for a multiuser system.

Second, using Unix greatly reduces the development cost and development time for such systems. Relying on Unix to provide the operating system makes it much easier and less costly to develop a multiuser microprocessor-based system and reduces the time to bring it to market.

Third and perhaps most important of all, however, Unix provides a standard environment common to multiple hardware vendors. This is important because it make users less dependent on the continued support from their system vendor, thereby making it easier to decide to buy from smaller, less secure vendors who offer attractive products at low prices.

Strong base

Equally important, however, is that in providing a standard environment for applications software, Unix has been able to attract a large and growing base of very capable software that can run on a large variety of Unix systems from many vendors. A very broad selection of both horizontal applications and specialized vertical market business software is readily available for Unix systems.

What Unix is not as likely to do, however, is to capture a large number of general business desktops. Despite the enthusiasm of the more aggressive and more successful proponents of Unix, the chances remain good that it will be the migration from DOS to OS/2, rather than a ground swell for Unix, that defines the operating system on the office desk top for the 1990s.

Nevertheless, it would be a major mistake for information system professionals in business organizations to ignore Unix. The operating system is likely to provide an invaluable key to unlocking and opening the doors to the very low costs that microprocessor-based systems provide in the service of large, corporatewide, mission-critical applications.

IN PROVIDING a standard environment for applications software, Unix has attracted a large and growing base of capable software.

Microprocessor-based Unix systems in various forms offer far lower costs than do traditional CPUs running proprietary operating systems from individual vendors. They thereby offer some of the least expensive and most effective tools for building the type of information systems that successful organizations will be required to have in the tougher decade ahead.

Zachmann is president of Canopus Research, a computer industry research firm in Duxbury, Mass.

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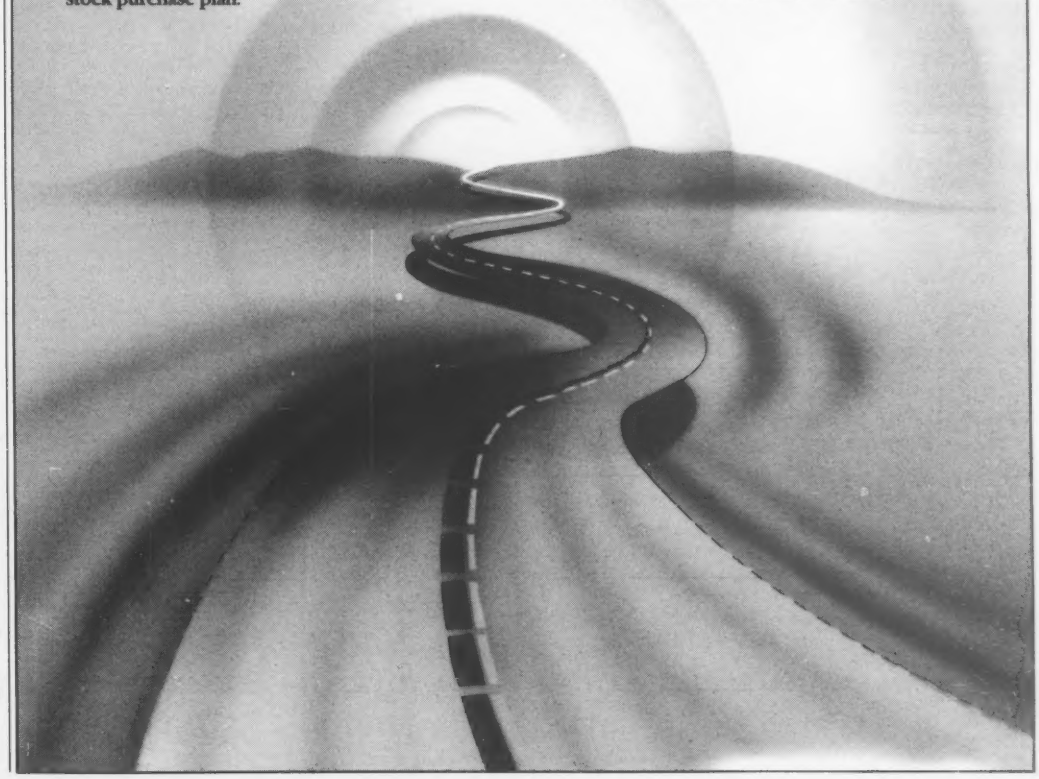

Operators facing automation

Data center improvements are taking jobs but offering opportunities

BY DAVID A. LUDLUM
CW STAFF

Through the years, computers have been harnessed to automate all sorts of mechanisms, displacing jobs along the way. Recently, computers themselves have become the target of labor-saving automation as data centers have snapped up software products that take over some of the work of operators and other workers.

The goal of data center automation in its extreme form is "lights-out" operations, analogous to robotized factories devoid of workers. While some companies eye this goal, many look to automated operations for more modest trimming of crews or improved service, or some of both. Whatever the impetus for change, the career implications bear watching.

"The impact is going to hit nearly every data center," says Leonard Eckhaus, president of the Association for Computer Operations Management (AFCOM) in Orange, Calif. His group plans to make the issue the subject of half of its next annual conference — to be held in February 1989 in San Diego — and to begin an annual gathering devoted entirely to it in September 1989. "This is going to become an industry of its own," Eckhaus says.

A slew of techniques and technologies have sprung up to help data centers lift some of the load from their operators and other personnel. The most common are systems that keep track of tapes and that schedule operations or control production. They are used by 80% and 62% of AFCOM members, respectively.

Others that are less widely used oversee documentation, manage disk space, monitor software performance, identify and react to problems, calculate chargeback, distribute reports, answer routine inquiries at consoles and check balances in reports or files.

Driving speed

Data center automation is driven by cost controls but also the urge to improve the speed and quality of service. "We have to go at machine speed; we can't go at people speed," says consultant Arnold Farber at Farber/LaChance, Inc. in Richmond, Va., a firm that specializes in data center automation.

Some data centers have cut positions by 50%, and some run unattended for four hours a night, Farber says.

However, most workers whose functions have been taken over by automation have been given new and more challenging jobs, sometimes running newly automated systems. Those whose positions were eliminated usually have been reassigned to other data processing jobs they consider more promising.

US West, Inc. began working on homegrown software to respond to console messages at its Bellevue, Wash., data center in 1984. The effort has generated service improvements worth millions of dollars a year, claims Jerry Henderson, a member of the technical staff who was project leader of the automation program.

But instead of eliminating positions, the company has plowed the manpower it has freed into further efforts to improve service. "In our view, automation is a service issue, not a cost issue," Henderson says. "Once you bootstrap and get the first few things done, it provides the resources to do more."

Computer operators who had been "glued to consoles waiting for things to happen" are free to update operations documentation, monitor hardware reliability, analyze problems and take classes, Henderson says.

Sovran Bank, NA in Richmond, which has automated tape management, scheduling and the output of microfiche, also has redeployed operators who had largely manual jobs such as hanging tapes. They have been switched to more technically demanding positions — some that call for programming, says Bill Grubbs, manager of output operations.

Du Pont Co. is an organization that has eliminated operations jobs. This year it consolidated operation of two data centers in Newark, Del., and now runs the smaller one — with three IBM 3090 mainframes — remotely. The company eliminated 19 jobs, including all at the smaller center except a couple of tape-mounting positions.

Some people got more challenging assignments in operations, but most went to other positions with "a DP flavor to them," says Steve Shey, operations supervisor at the data centers. The jobs include programming assistant, personal computer support and DP liaison for manufacturing departments.

Most of the reassigned operators prefer their new jobs, Shey says. "Almost every job was nonshift work. That's a very valued thing." The displaced operators are attractive to user departments, he adds. "The operators tend to know the structure, they have some contacts, they know what's happening in the data center when you make a call."

> "IN OUR view, automation is a service issue, not a cost issue. Once you bootstrap and get the first few things done, it provides the resources to do more."
>
> JERRY HENDERSON
> US WEST

Put 'em to work

Farber says companies automating a data center have an interest in retaining operations workers because "it takes the staff to automate the process." It would be difficult to rally them to the task if they suspected their livelihoods were at stake.

There should continue to be opportunities in data center automation. At Du Pont, Shey says, "We're going to really start cranking up our unattended operations."

Eckhaus says that in the future, data center automation products will have to talk to each other. "It's the only way to get to lights out," he says. "Right now, no one vendor has it all."

Ludlum is a *Computerworld* senior writer.

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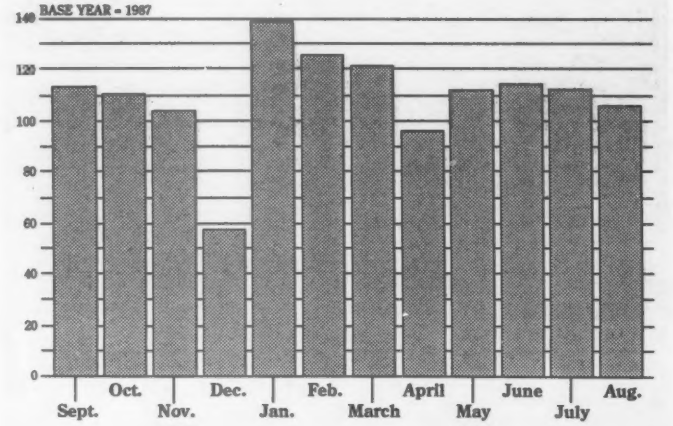
Computer recruitment advertising index*



*Analysis of computer recruitment advertising space in *Computerworld* and selected major U.S. newspapers

SOURCE: CW PUBLISHING, INC.'S RECRUITMENT MARKET RESEARCH DATABASE

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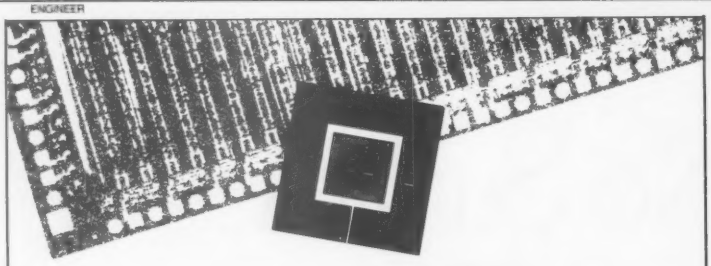

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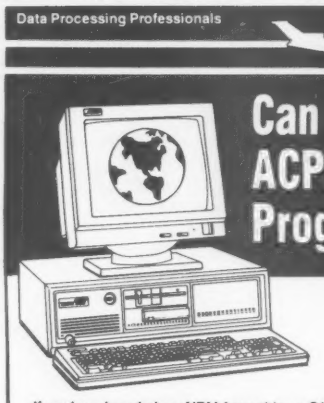

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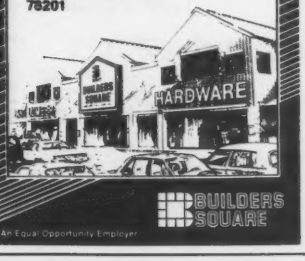

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MARKETPLACE

IBM offers printer promotion

But special offer may be tip-off that 3800 family is near the end of its life

BY NANCY DIPALMA
IDC FINANCIAL SERVICES CORP.

When IBM announced the 3800 Model 6 page printer back in January 1987, it stated that this model would be upgradable to the 3800 Model 3 at some point in the future. On Sept. 20 of this year, that upgrade option was quietly introduced at a price of $85,000.

In addition to making the 3800 Model 6 to Model 3 conversion available, IBM also announced a special limited-time promotional offering for this upgrade. The offer is available immediately at $50,000; terms and conditions have not been made available.

The promotional upgrade offer marks the second time this year that IBM has used financial incentives to move users into a Model 3. For example, on April 19, IBM announced a limited-time price reduction for the 3800 Model 1 to Model 3 upgrade. This offer is available until Oct. 22, and the upgrade cost is now $62,500, reduced from $95,000.

Along with the upgrade pricing and promotion, IBM also announced these two pricing actions: The Model 3's list price was decreased 11%, from $302,850 to $270,000; and the Model 6's list price was increased 15%, from $183,400 to $210,000.

Unsubtle encouragement

In reviewing this announcement, it seems apparent that IBM is trying to move all its customers into the Model 3. By decreasing the list price of the Model 3 to an attractive $270,000 and offering an affordable way to convert the Model 6 to a Model 3, IBM is encouraging users to move up to the Model 3.

Also, by increasing the Model 6's purchase price, IBM is discouraging users from purchasing this model.

A word of caution to Model 6 users: If you have any intention of upgrading to a Model 3, take advantage of the promotional period. Once this offer is withdrawn, the upgrade becomes an expensive $85,000.

Why is IBM encouraging all of its 3800 users to move to the top-of-the-line Model 3? Could it be that IBM is getting ready to replace this printer? International Data Corp. (IDC) Financial Services says the answer is yes. IDC is anticipating a replacement product for the 3800 family in the first half of 1989. The replacement will be in the 200 page/min range and will have a smaller footprint and improved paper-handling capabilities.

Time to blow taps?

At the time of this writing, the secondary market had not yet adjusted for the new list price of the Model 3. The recent IBM financial enticements aimed at the 3800 family indicate that this series may be nearing the end of its life cycle.

With users anticipating a replacement product, IDC Financial Services expects that the Model 3 will continue its price decline on the secondary market.

Secondary-market sources indicate that the IBM 4245 Model 12 market has tightened up recently. These printers were replaced by the IBM 6262s in February, and since that time there has been a strong supply of Model 12s available on the used market. However, current reports indicate that the supply of these printers has diminished and value has peaked.

As more reports of the 4245 Model 20's replacement circulate, used values for this printer continue to decline. IDC Financial Services expects the Model 20 to be replaced in the first half of 1989. The replacement will be in the print speed range of 2,000 to 2,500 line/min, possibly a 6262 Model 20.

Until the replacement is announced and shipped, the Model 20 should remain a viable alternative on the secondary market to satisfy users' band-printing needs.

For more information, contact IDC Financial Services Corp.'s Terri LeBlanc at 508-872-8200.

IBM printers

Current fair market value

	List price	Percent of retail	Percent of wholesale
3800 Model 3	$302,850*	44%	40%
4245 Model 12	$32,550	56%	50%
4245 Model 20	$37,500	60%	52%

* Current fair market value calls were made prior to Sept. 20 price decrease for 3800 Model 3.

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Technical library. Most MIS departments have technical libraries of manuals. It is worth considering supplementing the traditional technical manuals with books and other material, especially ones that have been read and recommended by staff.

Once again, staff members should be encouraged to disseminate summaries of what they read. Reimbursing them for books they have purchased is a gesture guaranteed to yield growth in library material.

Course reports. Staff members lucky enough to take an outside course should be required to write a formal report describing ways in which they expect to benefit and whether the course is worthwhile for others.

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Both trainee and trainer can benefit: the former from receiving training from somebody with whom he will be working alongside, enhancing the training's credibility; the latter from taking responsibility for training and from reinforcement of information that he may have forgotten.

Public television. A scanning of local Public Broadcasting System program schedules will reveal a number of data processing-related courses from basic computer literacy to more advanced systems development. MIS organizations should post these listings and perhaps make a television room available for workers who could take advantage of them.

Public library. Most public libraries are affiliated with state libraries, from which educational videotapes might be obtained free of charge. Local libraries may also have the Educational Film and Video Locator catalog. University libraries might be another source of video training material, since many allow public access to their media services for a fee. Many are networked through the consortium of University Film Centers.

Evening classes. Many community colleges offer evening classes leading to various degrees or certificates. The cost generally is not excessive and specific job-related matter may be covered, such as personal computer product training, basic analysis and program design.

Professional organizations. Membership in a professional organization usually includes a free or discounted subscription to its magazine, discounted fees at national conferences and opportunities to attend local chapter meetings. The opportunities for networking at national and local conferences are too good to pass up. Some organizations undertake projects or conduct surveys and pass on the results to all members.

Users groups. Dues for users groups are minimal — sometimes nothing at all. The groups provide opportunities for sharing very specific information related to a particular product, technique or field. They are ideal for brainstorming solutions to real problems.

Cross-training in applications. Often overlooked, this form of training can strengthen a department's skills in a number of ways. It can broaden the support base for applications, facilitate staff movement among teams by reducing learning curves and boost chances of uncovering errors, because more eyes are scrutinizing a system.

In-house presentations. Look around your department, and you will find experts — in a utility, a standard or technique, an aspect of project management. These people are well recognized, yet their expertise is rarely used fully. They should be given the opportunity to pass on their skills through short presentations. Lessons taught by one's peers are generally heeded.

THERE ARE some inexpensive and effective ways to compensate for being at the bottom of the budget totem pole that are suitable replacements, at least as stopgap measures, for programs of more halcyon days.

Duncan is a quality assurance consultant at a major Dallas bank.

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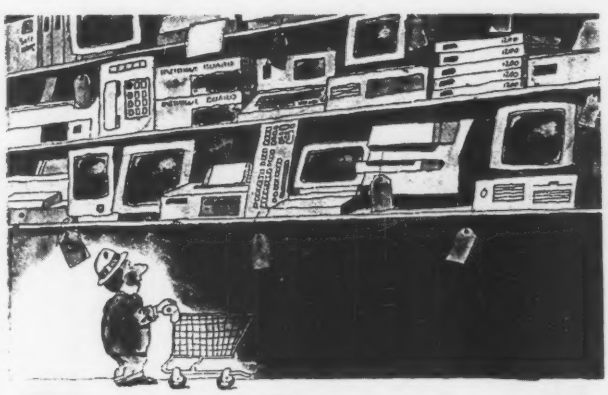

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Dec. 5	LAN's	Nov. 18
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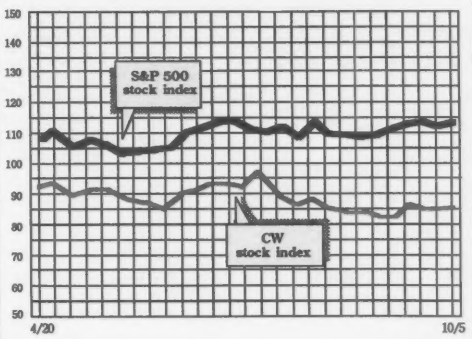

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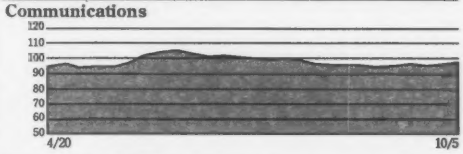

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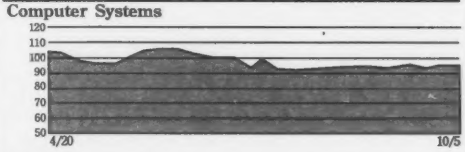

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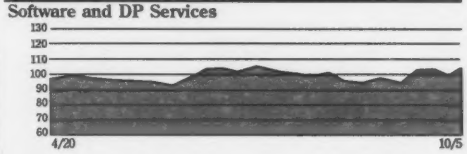

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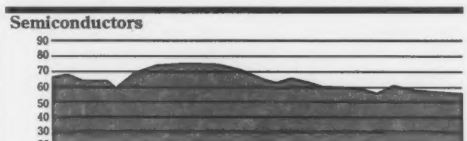

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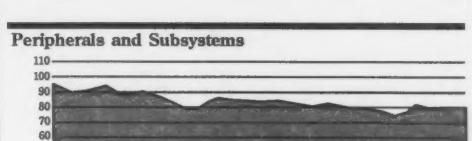

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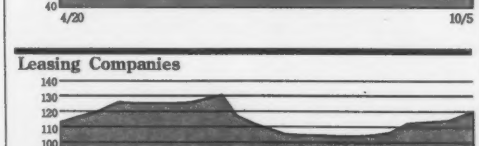

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E X C H		52-WEEK RANGE (1)	PRICE CLOSE OCT. 5	WEEK NET CHNGE	WEEK PCT CHNGE

Communications and Network Services

N	AMERICAN INFO TECHS CORP	100	74	93.375	0.6	0.7
Q	ANDREW CORP	19	11	16.5	0.0	0.0
Q	ARTEL COMM CORP	3	1	2.063	0.1	3.2
N	AT&T	34	20	26.375	0.5	1.9
Q	AVANT GARDE COMP INC	5	1	0.875	0.1	16.7
Q	AVANTEK INC	15	5	5.75	0.0	0.0
N	AYDIN CORP	33	16	21.75	-1.5	-6.5
N	BELL ATLANTIC CORP	80	61	71.375	0.9	1.2
N	BELLSOUTH CORP	44	29	40.25	-0.3	-0.6
Q	COMPRESSION LABS INC	6	2	3.125	0.0	0.0
O	COMPUTER NETWORK TECH	4	1	1.266	0.0	3.9
O	CONTEL CORP	38	25	37.625	-0.3	-0.7
Q	DATA SWITCH CORP	10	4	6.75	0.1	1.9
Q	DIGITAL COMM ASSOC	46	20	24	2.4	11.0
Q	DYNATECH CORP	29	14	20.5	-0.3	-1.2
Q	FIBRONICS INTL INC	5	2	3.5	0.4	12.0
Q	GANDALF TECHNOLOGIES	8	5	6.5	0.1	2.0
Q	GENERAL DATACOMM INDS	8	3	3.75	0.1	3.4
N	GTE CORP	44	29	43.25	0.4	0.9
Q	INFOTRON SYS CORP	14	5	12.25	0.9	7.7
N	ITT CORP	65	42	49.375	0.0	0.0
N	M A COM INC	13	7	9.875	-0.1	-1.3
Q	MCI COMMUNICATIONS CORP	21	7	20.375	0.6	3.2
Q	MICOM SYS INC	17	7	15.625	0.0	0.0
Q	NETWORK EQUIP TECH INC	28	12	16	0.5	3.2
Q	NETWORK SYS CORP	12	7	10.125	0.8	8.0
N	NORTHERN TELECOM LTD	22	14	17.875	0.0	0.0
Q	NOVELL INC	31	12	29.5	0.0	0.0
N	NYNEX CORP	78	58	65.5	0.1	0.2
N	PACIFIC TELESIS GROUP	33	23	30.125	0.1	0.4
N	PARADYNE CORP	7	4	5.625	0.4	7.1
A	PENRIL CORP	5	1	4.125	-0.3	-5.7
N	PLESSEY PLC	38	23	26.625	-0.3	-0.9
N	SCIENTIFIC ATLANTA INC	16	8	12.375	0.1	1.0
N	SOUTHWESTERN BELL CORP	45	22	39.875	0.1	0.3
Q	3 COM CORP	26	12	18.25	0.6	3.5
N	U S WEST INC	59	43	56.875	-0.6	-1.1

Computer Systems

Q	ALLIANT COMPUTER SYS	16	4	4.75	0.3	5.6
Q	ALPHA MICROSYSTEMS	8	3	6.5	0.0	0.0
Q	ALTOS COMPUTER SYS	15	7	8.75	0.6	7.7
A	AMDAHL CORP	28	10	18.625	-0.5	-2.6
Q	APOLLO COMPUTER INC	23	9	8.625	-0.4	-4.2
Q	APPLE COMPUTER INC	60	28	40.875	-2.6	-6.0
N	BOLT BERANEK & NEWMAN	25	12	13.5	0.4	2.9
Q	BRITTON LEE INC	4	1	2.375	0.0	0.0
N	COMPAQ COMPUTER CORP	79	34	54.375	-2.4	-4.2
Q	COMPUTER AUTOMATION INC	15	4	4.625	-0.8	-14.0
A	COMPUTER CONSOLES INC	9	2	8.5	-0.1	-1.4
Q	CONCURRENT COMP CORP	20	11	19.813	0.0	0.0
N	CONTROL DATA CORP DEL	37	18	21.625	-0.8	-3.4
Q	CONVERGENT TECH	7	3	6.438	0.0	0.0
Q	CONVEX COMPUTER CORP	15	6	8.625	1.4	19.0
Q	CRAY RESH INC	98	47	69.5	0.0	0.0
N	DAISY SYS CORP	12	5	8.125	-0.3	-3.0
N	DATA GEN CORP	37	16	19.125	0.4	2.0
N	DATAPOINT CORP	9	3	4.875	-0.3	-4.9
Q	DELL COMPUTER CORP	12	8	9.625	-0.1	-1.3
N	DIGITAL EQUIP CORP	200	88	88.5	-6.9	-7.2
N	FLOATING POINT SYS INC	10	3	2.625	0.1	5.0
N	GOULD INC	34	8	22.875	0.4	1.7
N	HARRIS CORP DEL	39	22	27.5	0.8	2.8
N	HEWLETT PACKARD CO	73	36	48.75	-0.3	-0.5
N	HONEYWELL INC	81	49	63.625	0.5	0.8
N	IBM	156	102	113.875	0.0	0.0
Q	INFORMATION INTL INC	16	9	13.75	0.0	0.0
Q	IPL SYS INC	4	1	3.625	0.5	16.0
N	MAI BASIC FOUR INC	21	9	17	-1.5	-8.1
Q	MASS COMPUTER CORP	13	4	4.25	-0.3	-5.6
N	MATSUSHITA ELEC INDL LTD	230	103	177.5	-8.5	-4.6
Q	MEGADATA CORP	5	2	1.625	-0.1	-7.1
Q	MENTOR GRAPHICS CORP	39	14	29	0.5	1.8
N	NBI INC	12	2	2.5	0.0	0.0
N	NCR CORP	86	50	56.5	-1.9	-3.2
N	PRIME COMPUTER INC	26	12	14.25	0.0	0.0
Q	PYRAMID TECHNOLOGY	16	5	13.75	0.0	0.0
Q	SILICON GRAPHICS CORP	25	11	17	-0.1	-0.7
Q	STRATUS COMPUTER	35	15	25	0.1	0.5
Q	SUN MICROSYSTEM INC	44	22	34.75	-0.8	-2.1
Q	SYMBOLICS INC	4	1	1	0.0	0.0
Q	SEQUENT COMPUTER SYS INC	19	9	16.875	1.3	8.0
N	TANDEM COMPUTERS INC	37	12	14.125	0.0	0.0
N	TANDY CORP	56	28	42	2.4	6.0
N	ULTIMATE CORP	36	9	10.125	-0.6	-5.8
N	UNISYS CORP	47	24	31.125	-0.9	-2.7
A	WANG LABS INC	19	9	9.25	0.0	0.0

Software & DP Services

Q	ADVANCED COMP TECH	6	1	1.813	0.1	3.6
N	AGS COMPUTERS INC	30	11	28.375	0.3	0.9
Q	AMERICAN MGMT SYS INC	20	9	14	0.4	2.8
Q	AMERICAN SOFTWARE INC	16	6	14.875	-0.5	-3.3
N	ANACOMP INC	12	4	9.5	0.5	5.6
Q	ANALYSTS INTL CORP	10	4	8.75	0.1	1.4
Q	ASHTON TATE	33	13	24	-1.0	-4.0
Q	ASK COMPUTER SYS INC	16	6	13	0.8	6.1
Q	AUTODESK INC	33	12	27.75	-0.4	-1.3
N	AUTO DATA PROCESSING	52	16	37.875	1.1	3.1
Q	BOOLE & BABBAGE INC	10	5	9.375	-0.4	-3.8
N	BUSINESSLAND INC	16	7	13.25	0.3	1.9
N	COMPUTER ASSOC INTL INC	37	15	27.875	-0.6	-2.2
Q	COMPUTER HORIZONS CORP	14	7	7.75	-0.1	-1.6
N	COMPUTER SCIENCES CORP	73	38	48.375	-0.6	-1.3
Q	CORPORATE SOFTWARE	15	5	11.25	0.3	2.3
N	COMPUTER TASK GROUP INC	16	9	14.625	1.4	10.4
Q	COGNOS INC.	14	4	6.375	0.0	0.0
Q	COMSHARE INC	25	12	20.5	-0.1	-0.6
N	CULLINET SOFTWARE INC	14	4	5.875	-0.1	-2.1
Q	DUQUESNE SYS INC	22	10	17.25	1.0	6.2
N	GENERAL MTRS (CLS E)	51	30	41.625	-0.6	-1.5
Q	HOGAN SYS INC	9	3	5.375	-0.1	-2.3
Q	INFORMIX CORP	31	7	9.25	1.8	23.3
Q	INTELLICORP INC	6	2	3.75	0.3	7.1
Q	KEANE INC	16	6	13.75	0.8	5.8
Q	LOTUS DEV CORP	40	16	20	0.5	2.6
Q	MANAGEMENT SCI AMER	14	6	7.5	-0.3	-3.2
Q	MICRO PRO INTL CORP	7	2	2.875	0.0	0.0
Q	MICROSOFT CORP	79	37	50.25	-2.8	-5.2
Q	MORINO ASSOCIATES INC	20	7	15	0.3	1.7
Q	NATIONAL DATA CORP	32	20	24.25	1.0	4.3
Q	ON LINE SOFTWARE INTL INC	19	4	5	0.6	14.3
Q	ORACLE SYS CORP	22	8	19.25	0.3	1.3
N	PANSOPHIC SYS INC	28	11	13.5	0.8	5.9
Q	PHOENIX TECHNOLOGIES INC	18	14	15.75	-1.8	-10.0
Q	POLICY MGMT SYS CORP	30	15	23.25	1.3	5.7
Q	PROGRAMMING & SYS INC	14	7	13	0.0	0.0
Q	RABBIT SOFTWARE INC	4	2	3.125	0.0	0.0
Q	RELATIONAL TECH INC	21	13	14.625	1.5	11.4
Q	REYNOLDS & REYNOLDS CO	30	14	21.25	-0.6	-2.9
Q	SEI CORP	22	10	18.25	-0.5	-2.7
Q	SHARED MED SYS CORP	27	15	18.375	-0.8	-3.9
Q	SAGE SOFTWARE INC.	13	5	7.625	-0.1	-1.6
Q	SOFTWARE PUBG CORP	27	5	23.875	0.0	0.0
A	STERLING SOFTWARE INC	11	6	7.625	0.8	10.9
Q	SUNGARD DATA SYS INC	20	10	19	0.3	1.3
Q	SYSTEMATICS INC	34	19	28.75	0.3	0.9
N	SYS. SOFT INC.	24	7	22.25	0.4	1.7
Q	VM SOFTWARE INC	18	7	14.5	-0.3	-1.7

Semiconductors

N	ADV MICRO DEVICES INC	24	8	8.75	-2.1	-19.5
N	ANALOG DEVICES INC	20	8	10.75	-0.4	-3.4
Q	ANALOGIC CORP	11	5	6.875	-0.3	-3.5
Q	CHIPS & TECHNOLOGIES INC	30	8	11.25	-0.5	-4.3
Q	INTEL CORP	42	18	25	-2.3	-8.3
Q	LSI LOGIC CORP	15	7	9.875	-0.1	-1.3
Q	MICRON TECHNOLOGY INC	26	5	20.5	0.5	2.5
N	MOTOROLA INC	73	35	39.875	-2.5	-5.9
N	NATL SEMICONDUCTOR	22	8	8.875	0.1	1.4
N	TEXAS INSTRS INC	79	36	39.125	-2.1	-5.2
A	WESTERN DIGITAL CORP	27	11	14	-0.1	-0.9

Peripherals

Q	ALLOY COMP.	10	2	2.75	0.3	10.0
N	AM INTL INC	8	3	5.625	0.1	2.3
Q	AST RESH INC	18	6	9	0.8	9.1
Q	AUTO TROL TECH CORP	6	3	5.25	0.4	7.7
Q	BANCTEC INC	14	5	8	-0.1	-1.5
Q	CIPHER DATA PRODS INC	10	4	8.75	-0.3	-2.8
A	COGNITRONICS CORP	4	2	2.875	-0.1	-4.2
Q	CONNOR PERIPHERALS	10	7	7.375	-0.4	-4.8
A	DATAPRODUCTS CORP	24	7	10.875	0.3	2.4
A	DATARAM CORP	9	5	8.5	0.1	1.5
N	EASTMAN KODAK CO	69	39	46.375	1.6	3.6
Q	E M C CORP MASS	25	4	4.375	0.0	0.0
Q	EMULEX CORP	11	4	10.375	0.3	2.5
Q	EVANS & SUTHERLAND	27	14	15	0.0	0.0
Q	ICOT CORP	8	3	3.375	0.3	8.0
Q	INTERLEAF INC	24	8	8	-1.0	-11.1
Q	IOMEGA CORP	5	1	3.063	-0.4	-12.5
Q	LEE DATA CORP	5	3	2.75	-0.1	-4.3
Q	MASSTOR SYS CORP	4	1	2.188	-0.1	-5.4
Q	MAXTOR CORP	16	6	6.5	-0.1	-1.9
Q	MICROPOLIS CORP	34	8	8.25	-0.3	-2.9
Q	MINISCRIBE CORP	17	5	8.75	0.0	0.0
N	MINNESOTA MNG & MFG CO	82	45	61.625	-2.4	-3.7
A	MSI DATA CORP	24	8	23	1.5	7.0
Q	PERSONAL COMPUTER PRODUCTS INC.	7	4	5.313	-0.1	-2.3
Q	PRIAM CORP	3	1	1.625	0.0	0.0
Q	PRINTRONIX INC	11	7	9.75	-0.3	-2.5
N	QMS INC	26	7	7.75	0.1	1.6
Q	QUANTUM CORP	18	8	12.5	-0.3	-2.0
N	RECOGNITION EQUIP INC	16	6	6.5	-1.0	-13.3
Q	REXON INC	9	4	7.125	-0.3	-3.4
Q	SEAGATE TECHNOLOGY	23	8	8	-0.6	-7.2
N	STORAGE TECH CORP	4	1	1.875	0.0	0.0
Q	TANDON CORP	4	1	1.688	0.0	0.0
A	TEC INC	6	3	3.375	0.4	12.5
N	TEKTRONIX INC	36	21	21.375	-0.4	-1.7
Q	TELEVIDEO SYS INC	3	1	0.75	0.1	9.0
N	XEROX CORP	80	50	57.75	1.1	2.0

Leasing Companies

Q	AMPLICON INC	17	7	16.25	1.8	12.1
N	CAPITAL ASSOCIATES INTERNATIONAL INC	8	4	6.75	0.0	0.0
N	COMDISCO INC	37	12	21.25	0.6	3.0
Q	CONTINENTAL INFO SYS	10	4	4.5	0.3	5.9
Q	LDI CORPORATION	17	9	13.25	0.0	0.0
Q	PHOENIX AMERN INC	5	2	3.375	0.3	8.0
Q	SELECTERM INC	6	3	5.25	0.5	10.5

EXCH: N — NEW YORK; A — AMERICAN; Q — NATIONAL

Cotton Tandy

Tandy's stockpot is sweetened with rumors of DEC alliance

Analysts in droves have noted it: When the going gets tough in the market at large, high-tech stocks take a leading-edge beating.

IBM, expected to announce uninspiring third-quarter earnings, fell 1⅜ points for the week to close Thursday at 114.

Rumors that Digital Equipment Corp. may bolster its low-end performance line by reselling personal computers made by Tandy Corp. were dandy for Tandy, which picked up a point to close the week at 41⅝. DEC, however, suffered from what some saw as a sign of the company's crumbling confidence in its ability to make it — literally and figuratively — in the microcomputer market. By Thursday's close, DEC stock was down 4⅞ points to 89.

Silicon Graphics, Inc.'s vaunted entry into the minisupercomputer workstation arena earned analysts' plaudits but failed to move investors; the stock closed Thursday at 16¼ points, down ¾ point for the week.

Lotus Development Corp. plunged about three points Friday after its latest announcement of a 1-2-3 Release 3.0 delay. Its stock was trading at 16¾ late Friday after beginning the week at 20.

NELL MARGOLIS

Compaq, AST now soft-pedal EISA

BY WILLIAM BRANDEL
CW STAFF

Leading supporters of the proposed Extended Industry Standard Architecture (EISA) bus are downplaying the significance of their proposed alternative to IBM's Micro Channel bus. Ironically, as the hoopla over that alternative dissipates, IBM continues to develop an Intel Corp. 30386SX personal computer based on its Personal Computer AT bus, sources said last week.

AST Research, Inc. and Compaq Computer Corp. have both softened their tone regarding EISA, hinting that their bus of the future will have little impact on the market.

"EISA is more a statement of direction — that ISA is not a dead-end street," said Alan Kramer, vice-president of systems engineering at AST in Irvine, Calif. In an interview last week, Kramer said AST has low expectations for its own future EISA products. AST's current and future bus is the 16-bit standard, he said, estimating that 15% of AST's PC sales by 1990 would be based on the EISA bus.

Mike Swavely, Compaq's director of marketing, reinforced Kramer's comments. Swavely said that the EISA-based machines would be expensive and would predominantly play a role as departmental server. He added that because of the high profit margins associated with 32-bit machines, EISA machines would not represent a large portion of Compaq's PC sales.

> "NOBODY seems to realize that 90% of PC owners today don't need a 32-bit bus."
>
> ED JUGE
> TANDY

Tandy Corp. product manager Ed Juge said he believes that the EISA bus issue has been overplayed. "Nobody seems to realize that 90% of PC owners today don't need a 32-bit bus." Most 32-bit bus machines will be used in niche applications, he said.

Meanwhile, sources close to IBM's PC division said that the company is currently developing and considering an introduction of a PC based on the 30386SX processor that will include the AT bus. IBM recently pressured *The Wall Street Journal* twice to recall the story, which the newspaper later decided to run.

By introducing the reported product, IBM could resolve its current PC market-loss problem, AST's Kramer said. "IBM has always been very good at dealing with reality," he added.

Doubtful

Twenty MIS managers interviewed at random said they do not believe the bus issue is being fought over their interests and that it will not impact their buying decisions. Almost all said there is no need for a 32-bit bus at this time, so they are willing to watch and wait as EISA and IBM slug the vendor issue out.

What MIS now wants are more affordable add-on products that take advantage of its AT bus investments. But most managers agreed that at best, the bus issue just leaves them confused.

"We're a small company, and for us now, the cost per unit for the PS/2 is ridiculous," said one MIS director. "We're looking for something that is clonable." Another said, "We've written a lot of our own software, and it is not compatible with OS/2. The Micro Channel offers us no big advantage. I'll stick with what I've got. I'm willing to wait a couple of years for a 32-bit bus."

Some firms exploiting IBM's MCA

BY DOUGLAS BARNEY
CW STAFF

While supporters of the proposed Extended Industry Standard Architecture (EISA) belittle IBM's Micro Channel Architecture (MCA), at least a handful of board vendors are prepping boards that reportedly exploit the MCA.

Details are scarce concerning these still unannounced products, but both Cumulus Corp. and Ideassociates, Inc. have boards in the works that would take advantage of the MCA's unique abilities such as multiple-processor support, 32-bit addressing and bus arbitration.

One firm, AOX, Inc. in Waltham, Mass., already has a board that exploits the so-called bus-master capabilities of the MCA.

For now, vendors are holding back EISA board development because the specification is incomplete, and they are skeptical that EISA will become a force in the industry.

"As far as I'm concerned, that standard doesn't exist yet, so we aren't doing anything," said Nora F. Gildes, director of marketing at Ideassociates.

So far, no one has convinced Gildes otherwise. "Compaq gave us outlines, but as far as I know, there's no standard specification. I am a bit skeptical about designing standards by committee."

Meanwhile, Gildes said her firm will announce MCA products next month that will do things that are simply not possible under the current Personal Computer AT bus. The firm also has MCA versions of all its board-level products.

Cumulus President Marty Alpert is even more pro-MCA. EISA vendors "are doing a disservice," Alpert said. Not only are they asking users to wait more than a year, but it will take at least another year for high-performance peripherals to arrive that could exploit EISA, Alpert argued.

Inching forward

In the meantime, board vendors that have been at work for 1½ years on MCA boards are finally getting closer to market. According to Alpert, users should look for several categories of boards to begin arriving early next year.

These include multiuser boards, small computer systems interface adapters that use the bus-master capability to act as host controllers, communications processors, smart industrial and scientific boards, smart graphics cards, true coprocessors, software and application-specific processors and desktop publishing systems with different processors for different activities. Cumulus is working on some boards that exploit the MCA, but Alpert would not detail what his plans are.

In fact, Alpert said he is skeptical that an EISA bus will ever make it to market and gives it only a 50-50 chance.

EISA supporter Digital Communications Associates, Inc. (DCA) was more charitable. But despite DCA's stated support of EISA, the firm is only "evaluating" the bus and is not sure what its product direction will be, a DCA spokesman said.

DEC splits

FROM PAGE 1

Speculation that DEC will resell an MCA-based Tandy PC if IBM chooses to reduce its 5% royalty fee is not unreasonable, one DEC official said.

DEC introduced Decnet/PCSA Client and Decnet-DOS software, both of which allow IBM MCA products to be integrated into Decnet. Part of the Tandy agreement calls for DEC to service current Tandy products in customer sites.

Company officials acknowledged that if customers were to demand MCA-based products or if the MCA were to become an industry standard, "we would have to change our marketing strategy." IBM MCA machines have taken hold largely in the upper reaches of the Fortune 1,000, a market coveted by both IBM and DEC.

> "THE BOTTOM LINE is that Digital now supports the Micro Channel. Digital can say what it wants, but . . . they have just announced that they support it."
>
> JOHN DUNKLE
> ABERDEEN GROUP

De facto support

"The bottom line is that Digital now supports the Micro Channel," said John Dunkle, vice-president of the Aberdeen Group, a Boston-based market research firm. "Digital can say what it wants, but by announcing support and service for Tandy's products, which include the Micro Channel, they have just announced that they support it."

The agreement enables DEC to resell future Tandy products that have not yet been announced. DEC will also fully integrate Tandy products into Decnet/OSI. DEC chose Tandy because of its distribution channels, said DEC officials, who did not rule out Tandy's selling DEC products in the future.

Speculation that the Tandy products will cannibalize the unannounced PVAX, DEC's 3 million instructions per second desktop "personal VAX," is not warranted, said Phoenix Technologies Ltd. Chairman and Chief Executive Officer Neil Colvin. He added that his company will "obviously be involved in the agreement," as it provides BIOS code to both Tandy and DEC.

"This agreement gives DEC a full product line and allows them to reach into IBM's back pocket," Colvin said. Without specifically referring to the PVAX by name, Colvin said "the machines will be targeted at different applications."

DEC also downplayed the impact the deal will have on the slow-selling Vaxmate, a computer that runs Microsoft Corp. MS-DOS and has an Intel Corp. 80286 processor and an IBM Personal Computer AT bus — a general description of a personal computer. "The Vaxmate is not a general-purpose personal computer," a spokesman said.

Despite its disclaimer on the Vaxmate and the addition of the Tandy line, DEC still lives in the shadows of its PC history, one analyst said.

This decade, DEC has introduced four PC-class machines: the Robin, the Rainbow, the Professional series and the Vaxmate. The latter is the only DEC PC still on the market. "It will take much more than the Tandy deal to get over their past," the analyst said.

Senior Editor Douglas Barney contributed to this report.

Do the funky spreadsheet

CAMBRIDGE, Mass. — New buyers of Lotus Development Corp.'s 1-2-3 Release 2.01 can soon be printing gussied-up spreadsheets, thanks to a product-bundling deal struck with Funk Software, Inc. last week.

Little more than a week after announcing its Allways spreadsheet publishing product [CW, Oct. 3], Funk Software copped the bundling deal that gives the $149 package free to 1-2-3 customers. The promotion will begin later this month when Allways begins shipping and will last as long as supplies hold out. Allways allows users to modify spreadsheets by adding shading and fonts and changing character sizes.

The deal demonstrated that Lotus is not content to let spreadsheet latecomer Microsoft Corp. grab away users with Excel's ability to doll up worksheets. In fact, some firms have Excel just to create better reports based on 1-2-3 data.

The Allways promotion is just one of the ways that Lotus is staving off competition and setting the stage for the eventual shipment of 1-2-3 Release 3.0, scheduled for the second quarter of next year.

For $15, Lotus is shipping Value Pack to customers, which allows them to remove copy protection and add Adobe Systems, Inc.'s Postscript and advanced graphics support. Customers also have the right to copy and distribute Value Pack throughout their organizations. Lotus has also tested bundling arrangements with other add-in products in various markets across the country.

What about current users of 1-2-3 Release 2.01 who want spicier spreadsheets? Spend the $149, Lotus said.

DOUGLAS BARNEY

Cullinet fires comeback salvo

Support strategy is linchpin of offensive; Unix support readied

BY STANLEY GIBSON
CW STAFF

ST. LOUIS — Fighting an uphill battle to reverse its recent fortunes, Cullinet Software, Inc. last week sought to portray itself as the best source of software tools for large corporations.

Before some 4,000 users gathered here at the annual Cullinet User Week, company officials outlined the firm's strategy, called Cullinet Enterprise Computing, which they said will make heavy use of cooperative computing on a variety of platforms.

The strategy builds on Cullinet's previously announced three-by-three approach, meant to provide database, application and computer-aided software engineering tools across mainframes, departmental processors and personal computers.

"We're very interested in the ability to distribute data. We want the user to manipulate the data on a PC," said Robert Curran, executive director of computer services at Tufts University in Medford, Mass., a large Cullinet user.

Enterprise Computing will stress client-server computing, in which workstations interact closely with corporate mainframes or departmental processors. "The goal would be to access data from any SQL-based database," Cullinet Executive Vice-President John Landry said.

Cullinet's Landry

Going to Unix

Landry said that next month, Cullinet will announce support of AT&T's Unix System V. He suggested that a Unix version of IDMS/SQL will be available in the first quarter of 1989.

Landry also said support for Oracle Corp.'s Oracle relational database will come in the first quarter of 1989. Landry said that Cullinet's application development products, Enterprise: Builder/VMS and Enterprise: Generator/VMS (formerly called Knowledgebuild) will support Digital Equipment Corp's. RDB as well as Oracle environments.

Cullinet also chose the users' meeting to fire its salvo in the battle of transaction-processing benchmarks, unveiling results of a test of the TP1 benchmark on a DEC VAX 8820. The firm tested a new version of IDMS/SQL, which Cullinet renamed Enterprise:DB/VMS.

The version achieved 43 transaction/sec., or about twice the performance of the original IDMS/SQL, which was announced in April. The results were verified by Aim Technology in Santa Clara, Calif.

Enterprise:DB/VMS is slated for fourth-quarter delivery for license fees ranging from $8,000 on a Microvax II to $314,000 on a high-end VAX 8840.

Cullinet sought to emphasize its work with the VAX as a cornerstone of its enterprise strategy. By introducing VAX software last spring, Cullinet sidestepped IBM's 9370 and has since taken a wait-and-see attitude toward the IBM Application System/400.

However, Landry said last week that Cullinet may develop software for users interested in AS/400 software.

In seeking to fill an enterprise's computing needs, Cullinet is going up against a multitude of others attempting to satisfy those same needs — including IBM.

"They don't have the resources to compete with IBM" or Oracle, said Dale Kutnick, an independent consultant in Redding, Conn.

"Of course you are concerned about their financial situation. But if they continue to pay attention to the requirements of their user base, they will do better," Curran said. "We feel they have addressed the distributed need. With earlier products, that was not the case."

"They'll be around," said Michael Wilk of Oakland County North's data processing department in Michigan. Like Curran, he said he is interested in implementing cooperative processing between PCs and mainframes.

Cullinet Chairman and Chief Executive Officer John J. Cullinane expressed optimism: "We've got a lot of programs on a lot of fronts. We're starting to hit on all cylinders."

What's in a name?

Cullinet added some names and changed others as new and enhanced products were unveiled at its users' meeting:

- Cullinet's Knowledgebuild is no more. It is now called Enterprise:Builder/VMS and Enterprise:Generator/VMS. Cullinet also introduced Enterprise:Builder/PC-DOS and Enterprise:Generator/PC-DOS. The application development products, scheduled to be made available in the first quarter of 1989, will generate third-generation language code for a variety of platforms.
- A multiple application banking package for IBM and compatible mainframes. The package consists of a number of modular units, including software developed by Bob White Software, a Cullinet acquisition in 1984. A complete basic package is priced at $2 million.
- IDMS/Architect, Cullinet's microcomputer-based computer-aided software engineering tool that provides micro-to-mainframe communication, is currently being shipped. In addition, Cullinet said the IDMS-DC and IDMS-UCF version of Enterprise:Expert/MVS — formerly called the Application Expert — an expert system development tool for IBM mainframes, is currently available.
- An implementation workbench for use with Release 1.3 of Cullinet Applications Software, a microcomputer facility said to cut implementation time, will be shipped in the fourth quarter, Cullinet said.

STANLEY GIBSON

DEC readying OS/2 LAN plans

BY PATRICIA KEEFE
CW STAFF

BURLINGAME, Calif. — Microsoft Corp.'s OS/2 LAN Manager is expected to get the nod today from the industry's two leading minicomputer makers at a briefing here.

A 3Com insider and industry sources close to the vendors said the anticipated show of support from Digital Equipment Corp. and Hewlett-Packard Co. will both significantly boost efforts to position LAN Manager as the standard for OS/2 connectivity and alleviate users' micro-to-mini and wide-area-communications headaches.

In an era of downsizing, systems vendor support for OS/2 LAN Manager will help provide a smooth migration path from the desktop to incompatible mini applications and greater processing power, said Steven Wendler, an analyst with Stamford, Conn.-based Gartner Group, Inc.

Mid-range support for OS/2 would also breathe new life into many middle-aged mini lines by allowing local-area networks to utilize minis as high-powered servers, analysts said.

Desktop users would also gain access to applications such as DEC Windows without the requirement of local storage and processing power. Also, users could facilitate true wide-area networking by using HP's Advancenet or DEC's Decnet to bridge remote LANs.

Spreading the word

DEC and HP are expected to make their announcements at the 3Com Network Systems Forum. Actual capabilities are unlikely to be available before mid-1989. Also, 3Com is expected to confirm commercial availability for the first phase of 3+Open.

HP will detail plans to support 3+Open, 3Com's LAN Manager-based network operating system, under Openview, the mini maker's Open Systems Interconnect-based network management system, sources close to HP and within 3Com said.

Sources added that HP, which has contracted with Microsoft to develop LM/X, a Unix-based port of LAN Manager, will work with 3Com to integrate LM/X into 3+Open. This would provide 3Com with an entry into the Unix market, which it now lacks.

And DEC — which has expended a lot of energy on efforts to shore up its sagging desktop and PC LAN fortunes (see story page 1) — will tap LAN Manager as a key component of its OS/2 connectivity strategy, sources close to DEC confirmed.

"From a tactical and strategic point of view, minicomputer vendors don't want to get cut off from the desktop," Wendler said.

Reportedly in discussion stages are Wang Laboratories, Inc., another 3Com OEM, and Data General Corp., sources added.

3Com and HP spokeswomen confirmed that HP will make an announcement today but would not comment further. But 3Com President William Krause reportedly has said to expect a DEC-3Com announcement this week. Efforts to reach Microsoft and DEC were unsuccessful.

The ties between the four vendors are strong. Both HP and DEC are OEMs of Microsoft Networks, LAN Manager's predecessor, and both have relationships with 3Com.

The announcements would represent a real coup for Microsoft and 3Com, analysts agreed. If enough systems vendors jump on the LAN Manager bandwagon, it could force IBM to openly embrace that protocol. Users have been hesitant, delaying LAN purchases as they wait for IBM to reveal its plans concerning LAN Manager, said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C. "As more people belly up to the [LAN Manager] bar, more users will look very seriously at it," he said.

Industry observers said the announcements will make Novell, Inc., the acknowledged leader in the MS-DOS LAN market, appear more vulnerable — especially after Microsoft, in a surprise move two weeks ago, yanked the rug out from under a planned SQL-related strategic alliance between Novell and Ashton-Tate Corp. [CW, Oct. 3].

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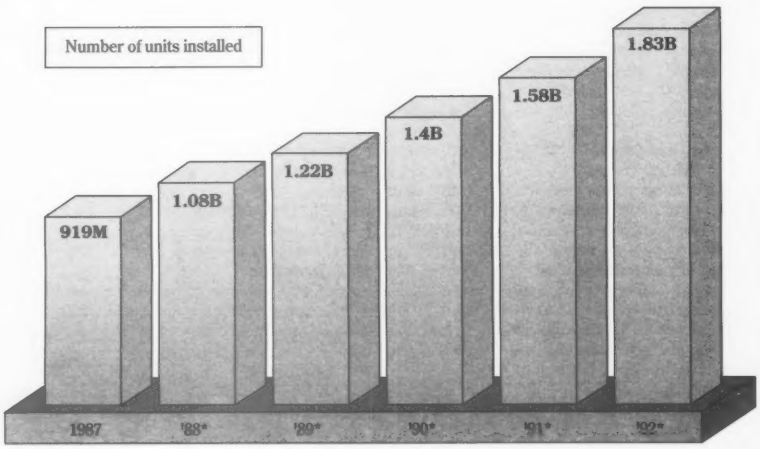
TRENDS

Fiber optics

U.S. installations of fiber-optic LANs should double



*Projected

Fiber optics has found a niche that slowly but surely will provide users with data communication that is dramatically more cost-effective and flexible than current local-area networks.

That was the conclusion of a recent report on industrial LANs performed by The Information Network, a San Francisco-based market research firm.

Optical fiber use in LANs offers several benefits over twisted-pair wiring and coaxial cable. The small size allows for easy routing. Also, high bandwidth permits fiber-based systems to carry upwards of 500 MHz/km.

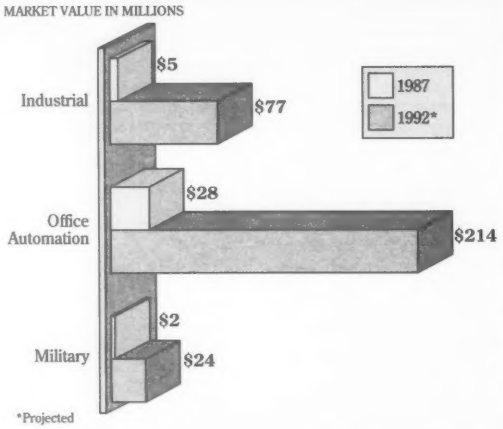
The total U.S. market for fiber-optic LANs should grow from $35 million in 1987 to $315 million in 1992. Installations are projected to nearly double in the same time frame.

The office automation sector is expected to contribute greatly to this growth, as Bell operating companies begin to replace private branch exchanges with fiber-optic LANs. The report predicts this portion of the industry will see an explosion in revenue from $28 million in 1987 to $214 million in 1992.

Although the implementation of fiber-optic LANs has been slow, the price/performance outlook is sunny. The Information Network estimates that a fiber-optic LAN now costs $1,300 per connection for a star topology and $1,000 for a bus; those prices are expected to decrease by 1992 to $500 and $400, respectively. The number of connections per LAN is projected to simultaneously increase from 30 to 325.

LAURA O'CONNELL

Value of installations by application



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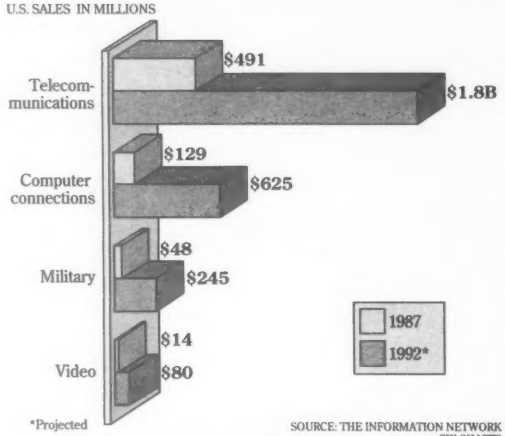
U.S. fiber-optic market by segment



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SOURCE: THE INFORMATION NETWORK
CW CHARTS

INSIDE LINES

So close, yet so far. AT&T had intended to hold a press conference in New York Thursday to announce it was joining the Open Software Foundation, but the gathering was canceled at the last minute, according to a source with ties to the OSF. The source indicates the stumbling block is AT&T's demand that it join the OSF board along with 10 other new members. Reportedly, Sun's Bill Joy was the mastermind behind this strategy. The OSF apparently fears such a move would tilt the board in AT&T's favor.

If at first you don't succeed . . . OK, so Microsoft nixed Novell's plans to bundle Ashton-Tate's Dbase IV and SQL Server with the Netware network operating system. Well, all is not lost; look for Ashton-Tate to swing a similar, Microsoft-sanctioned deal with longtime buddy 3Com, substituting 3+Open for Netware.

Our heads are spinning. Independent database management system vendors are forging relationships with DEC left and right — or is it the other way around? Relational Technology and DEC are scheduled to hold a briefing Oct. 17 to announce an agreement involving their two DBMSs, Ingres and RDB. The next day, at Dexpo, Oracle and DEC are slated to announce a technology and development agreement, Oracle officials told us. And Cullinet, at its users' conference last week, stated that its products will support RDB.

Bull-y-ing on maintenance? Honeywell Bull has verbally informed several customers that DPS 7 and 8 series mainframes deinstalled for more than 10 days must be returned to Phoenix for maintenance recertification by the vendor. Under the current written policy, buyers of used machines could have them recertified after 30 days of operation at the new site. "This will put the squeeze on being able to sell a used box," said Walt Pinson, MIS manager at Walter Drake & Sons in Colorado Springs — one user who has been told of the new policy.

They stoop so low. Early buyers of IBM's AS/400 are reportedly being told that the system will only recognize IBM PCs and terminals as input devices. But in a recent test of the system at an IBM customer training center, the system recognized a Leading Edge PC, much to the relief of customers who purchased a mass of non-IBM terminals for their new AS/400.

Something for everyone. Switch vendor Northern Telecom is expected to detail plans to support both IBM's SNA and DEC's Decnet architectures via a new communications processor and a network management system. The processor will utilize different line cards that, for example, would let one card run IBM's Synchronous Data Link Control with SNA, another to run Ethernet with TCP/IP and yet another to run X.25, said Bart Stuck, an analyst at Probe Research.

We'll all be extra HLAPPI. IBM will answer the wishes of many programmers at big corporations by including a high-level terminal emulation application programming interface with OS/2 Extended Edition 1.1, which is scheduled for release next month. The Extended High-Level Application Program Interface, or EHLLAPI, is an extended version of IBM's group of callable functions designed to emulate terminal user operations. The current version of HLLAPI is a favorite among many corporate users who let IBM know their feelings, said David Harrington, product manager at IBM's Data Systems Division in Austin, Texas.

In the confusion of DEC's Micro Channel feelers (see page 1), DEC officials said their own Vaxmate is not a PC; it's a networking product. But on Friday, a DEC spokesman included the system in a list of DEC's past PC offerings; this reminded us that DEC President Ken Olsen called the Vaxmate a corporate PC when it was introduced in 1986. Following the Tandy deal, cynics quickly noted, the Vaxmate may soon not be a product at all. If you have the line on DEC's PC strategy of the month, call the hot line at 800-343-6474 or 508-879-0700. But don't ask for the news editor; he's on vacation, and Executive Editor Paul Gillin is leading our rapid response team.

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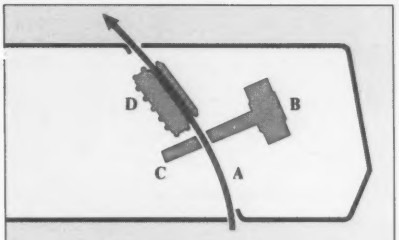

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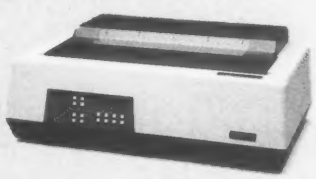

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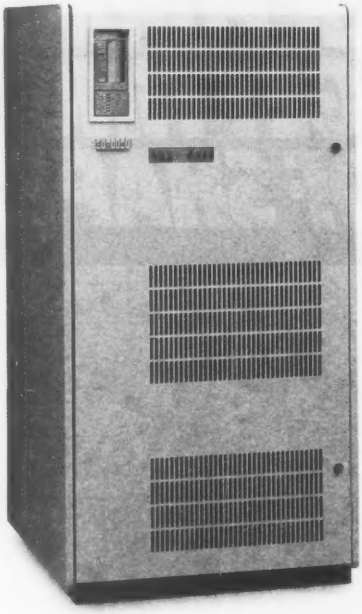

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